



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
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April 5, 2007

Memorandum

To: Robert Bennett, State Director, Bureau of Land Management, State Office,
Cheyenne, Wyoming

From: Brian T. Kelly, Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field
Office, Cheyenne, Wyoming /s/ Brian T. Kelly

Subject: Biological Opinion for the Impacts from the Wyoming Bureau of Land
Management Resource Management Plans and their Effects to the Ute ladies'-
tresses orchid (*Spiranthes diluvialis*)

This correspondence is in response to the U.S. Bureau of Land Management's (Bureau) request for formal consultation for the impacts from the Bureau's Wyoming Resource Management Plans (RMPs) to the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) in Wyoming. The U.S. Fish and Wildlife Service (Service) has reviewed the biological assessment (BA) submitted by your office describing the effects of the Wyoming Resource Management plans and proposed Bureau-committed conservation measures on the Ute ladies'-tresses orchid. Your October 6, 2005, request for formal consultation was received on October 7, 2005. Your change in effects determination for the effects of the Mineral and Geology Program was received April 7, 2006. Your adjustments to your BA including "committed conservation measures" were received July 31, 2006. This correspondence is provided in accordance with section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended (50 CFR §402.13 and §402.14).

This correspondence addresses potential adverse effects to the Ute ladies'-tresses orchid from the described Bureau activities of all planned programs according to all Wyoming Bureau Resource Management Plans as well as the Bureau's commitment to the Conservation Measures listed in the Bureau's Statewide Programmatic Ute ladies'-tresses Biological Assessment. These planned programs are (1) Access, (2) Air Quality, (3) Areas of Critical Environmental Concern (ACECs), (4) Cultural Resources, (5) Fire, (6) Forest Resources, (7) Geology and Minerals, (8) Hazardous Materials, (9) Lands and Realty, (10) Livestock Grazing, (11) Off-Highway Vehicles (OHVs), (12) Paleontological Resources, (13) Recreation Resources, (14) Riparian Areas, (15) Sensitive Plants, (16) Soil, (17) Surface Disturbance Restrictions, (18) Threatened, Endangered, and Candidate Species Protection, (19) Vegetation Resources, (20) Visual Resources, (21) Watershed and Water Resources, (22) Wild and Scenic Rivers, (23) Wild Horse, (24) Wilderness Resources, and (25) Wildlife Habitat Management. This correspondence will cover all RMPs in Wyoming except the Snake River RMP and the

Newcastle RMP as formal section 7 consultation was recently completed on those RMPs (WY7304, December 19, 2003; WY8796b, October 5, 2004). The RMPs covered in this consultation are the Buffalo, Platte River (Casper), Cody, Kemmerer, Lander, Pinedale, Great Divide (Rawlins), Green River (Rock Springs), Worland-Grass Creek, and Worland-Washakie RMPs.

This correspondence has two parts -- (1) informal consultation for "no effect" (NE) and "not likely to adversely effect" (NLAA) determinations for effects to the Ute ladies'-tresses under certain programs in all resource areas, and (2) a biological opinion for potential adverse effects from livestock grazing in all of the Bureau's resource areas and from coal bed methane development in the Platte River and Buffalo Resource Areas.

This consultation is based primarily on our review of your BA (BLM 2005) and the Bureau-committed Conservation Measures as described in your October 6, 2005, letter of initiation of consultation or subsequently developed and committed to by the Bureau (see Appendix). A complete administrative record of all documents and correspondence concerning this consultation is on file in the Wyoming Ecological Services Field Office in Cheyenne, Wyoming.

Consultation History

The Service and the Bureau began statewide programmatic formal consultation on impacts of Bureau activities to the Ute ladies'-tresses orchid on October 23, 2001. Greystone consultants provided an electronic draft of the BA in September 2004. The Service received the Bureau's request for formal consultation on this proposed action on October 7, 2005. On November 2, 2005, the Service issued a memo to the Bureau notifying them that all materials necessary for the initiation of formal consultation had been received. A subsequent December 2005 request by the Bureau to alter prioritizations for consultation delayed the completion of this BO. On April 7, 2006, the Service received documentation from the Bureau changing the determination for the effects of the Minerals and Geology Program to "Likely to Adversely Affect" in the Platte River and Buffalo Resource Areas. On July 31, 2006, the Service received the Bureau's adjusted list of conservation measures designed to protect and conserve Ute ladies'-tresses on lands on which the Bureau authorizes activities. On August 1, 2006, the tracking number for this consultation was changed from WY9881 to WY06F0205. On March 7, 2007, the Service received the Bureau's comments on the draft BO and then proceeded to finalize this consultation.

Informal Consultation

In its BA, the Bureau made "not likely to adversely affect (NLAA)" or "no effect (NE)" determinations for the effect of its management programs on the Ute ladies'-tresses orchid in the following Wyoming Bureau resource areas. The NLAA and NE determinations made by the Bureau are displayed in Table 1.

Table 1. Ute ladies'-tresses "not likely to adversely affect (NLAA)" and "no effect (NE)" determinations made by the Bureau.

Resource Management Plan Program Type	Buffalo	Platte River	Cody	Kemmerer	Lander	Pinedale	Great Divide	Green River	Worland-Grass Creek	Worland-Washakie
Access	-----	-----	-----	-----	NLAA	NLAA	-----	-----	-----	-----
Air Quality	NE	-----	NE	NE	-----	NE	NE	NE	NE	NE
ACECs	-----	NE	-----	-----	NE	NE	NE	NE	NE	NE
Cultural Resources	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Fire	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Forest Resources	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Geology and Minerals	-----	-----	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Hazardous Materials	NLAA	-----	NLAA	-----	-----	-----	-----	NLAA	NLAA	NLAA
Lands and Realty	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
OHVs	NE	-----	NE	NE	-----	NE	-----	NE	NE	NE
Paleontological Resources	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Recreation Resources	NLAA	NLAA	NLAA	NLAA	-----	NLAA	-----	NLAA	NLAA	-----
Riparian Areas	-----	-----	-----	-----	-----	NLAA	-----	-----	-----	-----
Sensitive Plants	-----	-----	-----	-----	-----	-----	NLAA	-----	-----	-----
Soil	NLAA	NLAA	-----	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Surface Disturbance Restriction Decisions	-----	-----	-----	-----	-----	NLAA	-----	-----	-----	-----
T&E Species	NLAA	-----	-----	-----	-----	-----	-----	NLAA	-----	NLAA
Vegetation Resources	NLAA	-----	-----	-----	-----	-----	-----	NLAA	NLAA	-----
Visual Resources	NLAA	-----	NLAA	-----	-----	NLAA	NLAA	NLAA	NLAA	NLAA
Watershed/Water Resources	NLAA	-----	NLAA	NLAA	-----	NLAA	-----	NLAA	NLAA	NLAA
Wild and Scenic Rivers	NE	-----	-----	-----	-----	NE	-----	-----	-----	-----
Wilderness	-----	-----	-----	-----	NE	NE	-----	-----	-----	-----
Wild Horse	-----	-----	NE	-----	NE	NE	NE	NE	NE	NE
Wildlife and Fish	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA

The Service concurs with your determinations that activities listed in the preceding table will not be likely to adversely affect or will have no effect on Ute ladies'-tresses because (1) the activity will not occur in Ute ladies'-tresses habitat, (2) the activity by its very nature will have no effect

or will not be likely to adversely affect Ute ladies'-tresses, (3) Bureau-administered lands in these Bureau resource areas are not likely to contain occupied Ute ladies'-tresses habitat, (4) no Ute ladies'-tresses have been recorded within these resource areas in the recent past, or (5) the Bureau has committed to implementing conservation measures (see Appendix) that will reduce the likelihood that any Bureau-authorized actions would adversely affect the Ute ladies'-tresses orchid.

Habitat destruction and habitat fragmentation due to urban, residential, agricultural, or recreational development within riparian or lacustrine floodplain areas may influence the Ute ladies'-tresses orchid in some portions of its range. However, these effects are considered unlikely to occur as a result of discretionary actions of the Bureau as authorized under the Bureau's RMPs in Wyoming.

Additionally, the following effects are considered unlikely to occur as a result of discretionary actions of the Bureau as authorized under the Bureau's Cody, Kemmerer, Lander, Newcastle, Pinedale, Great Divide, Green River, Worland-Grass Creek, and Worland-Washakie RMPs in Wyoming. These effects are: (1) mortality or harm due to hydrologic changes from oil and gas leasing activities, and (2) mortality and harm due to water quality changes as a result of oil and gas leasing activities.

The following discussion describes the Wyoming Bureau's RMP programs and the anticipated effects of those programs on Ute ladies'-tresses. Conservation Measures (see also Appendix) were identified in the Bureau's Programmatic Ute ladies'-tresses BA and the Bureau has committed to implement those conservation measures. For the purposes of this consultation, the Service has analyzed the effects to the Ute ladies'-tresses orchid taking into account the Bureau's commitment to the implementation of the conservation measures. Conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat. As per the Bureau's memorandum of October 6, 2005, commitment of the Bureau to the conservation measures will be formalized through a maintenance action of the Cody, Kemmerer, Lander, Newcastle, Pinedale, Great Divide, Green River, Worland-Grass Creek, and Worland-Washakie RMPs following completion of this consultation.

General Description of Activities Identified in Table 1. The following discussion is a general overview of the Wyoming Bureau Resource Management Plan Activity Programs and potentially-authorized activities of the Bureau which are not likely to adversely affect or will not affect the Ute ladies'-tresses orchid, now or in the foreseeable future. The names of the different programs are summarized here as in the BA (see Table 3-1, BLM 2005) to accommodate similar activities under varying program names between the individual RMPs.

Access.

Program Description. The Bureau's Access Management Program activities are generally in support of other resource management programs. Under this program, the Bureau maintains existing Bureau roads and easements. In addition, the Bureau negotiates with landowners for easements or selects alternatives to the route to secure public access as identified in a district transportation plan.

The objective for access management is to provide suitable public access to Bureau-administered public lands. This may include acquiring new access where needed, maintaining and expanding existing access facilities, or abandoning and closing access where it is not compatible with resource values and objectives.

Under this program, access across private lands is pursued through a variety of methods including, but not limited to, purchase of rights-of-way or easements, land exchange, reciprocal rights-of-way, and other statutory authorities. Specific routes and acquisition procedures for securing access are determined through route analyses and environmental analyses as part of specific project and activity planning. Where appropriate, land exchanges or cooperative agreements are considered to provide access needs.

Areas with high road densities are also evaluated to determine needs for specific road closures or rehabilitation. Specific mitigation measures and design requirements for roads are developed through environmental analyses as part of specific projects or activity planning. Access closure, abandonment, and acquisition are considered and established through activity planning and environmental analysis processes. Road or trail closure and abandonment is based on desired road or trail densities, demands for new roads, closure methods (e.g., abandonment and rehabilitation, closures by signing, temporary or seasonal closures), type of access needed, resource development or protection needs, and existing uses.

Anticipated Effects. Only the Lander and Pinedale Resource Areas have Access Programs as part of their RMPs. As access management activities are not expected to occur in the habitat of Ute ladies'-tresses orchid populations on Bureau-administered surface lands in the Lander and Pinedale resource areas and also given that the Bureau has committed to limiting ground disturbance and other potentially-impacting activities; ensuring productive soils; restoring, maintaining, or improving plant communities; reducing the likelihood of weed introductions; reducing adverse impacts from livestock; and ensuring the proper control of weeds and pests within Ute ladies'-tresses habitat, activities associated with Access Programs are not likely to adversely affect the Ute ladies'-tresses orchid in these resource areas.

Air Quality.

Program Description. The Bureau's Air Quality Program consists of monitoring efforts in cooperation with the U.S. Forest Service (FS), Wyoming Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA), and evaluating and regulating surface development. Monitoring for air quality components (i.e., carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, particulate matter, visibility, atmospheric deposition, etc.) is conducted from various facilities around the State.

Air Quality Program actions within the resource area consist of installation and maintenance of monitoring equipment. Air quality monitoring station sites generally occupy less than one acre, are often fenced off from other activities, with an unimproved, two-track, access trail to the site near a county road or other legal, physical access. Creation of a monitoring station typically takes less than two days of construction, and a site may be in continuous operation for many years. Air monitoring stations generally consist of metering equipment contained in a barrel shaped container propped off of the ground on various forms of frame, or small, covered weather station sheds or platforms. In some cases, there may be short towers (approximately 30 feet or less in height) with cup anemometers and other instruments attached, and solar collectors for power. Air monitoring stations are maintained on-site on a weekly or near weekly basis, with

each routine maintenance session usually taking less than two hours to perform. Actual operation of the monitoring equipment is practically unnoticeable. The majority of these facilities occur on private or state lands.

Anticipated Effects. Air Quality Program activities do not occur in Ute ladies'-habitat. Monitoring stations are not placed and will not be placed in the riparian habitat of the Ute ladies'-tresses orchid. Therefore, it is anticipated that there will be no effect of these activities to the Ute ladies'-tresses orchid.

Areas of Critical Environmental Concern (ACECs).

Program Description. Under this program, the Bureau designates Areas of Critical Environmental Concern (ACECs) and manages and protects important historic, cultural, scenic, wildlife, and other natural resources. Designated ACECs require intensive management of all surface-disturbing activities. Plans of operation must be approved for all exploration and mining operations in areas designated as ACECs.

Under the ACEC program, the Bureau closes areas where accelerated erosion is occurring, applies restrictions on ground-disturbing activities, and implements restrictions on logging and heavy equipment use. Recreational trails may be built and guided tours may be provided as well as completing land exchanges. ACEC activities help ensure protection of petroglyphs, artifacts, and cultural deposits from weathering and vandalism. Another activity under this program includes the evaluation of noxious weed and grasshopper control measures.

Anticipated Effects. As ACEC Management activities are not expected to occur in Ute ladies'-tresses habitat on Bureau-administered lands in Wyoming, activities associated with the ACEC Program are expected to have no effect to the Ute ladies'-tresses orchid in all resource areas. If populations are discovered on ACECs in Wyoming, it is anticipated that the added protections of the ACEC would further serve to protect the populations from disturbance. Furthermore, the Bureau has committed to implementing a number of conservation measures to protect Ute ladies'-tresses populations in Wyoming. These protective measures are designed to limit project-related ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat (see Appendix). These measures will further protect the Ute ladies'-tresses orchid in Wyoming.

Cultural Resources.

Program Description. Under this program, the Bureau performs a variety of activities to preserve, protect, and restore cultural and historical resources. During inventory activities, the Bureau inventories, categorizes, and preserves cultural resources, conducts field activities, performs excavations, maps and collects surface materials, researches records, and photographs sites and cultural resources. Inventory data collection activities are used for documentation and development of mitigation plans prior to other resource program surface disturbing activities. Inventory activities may entail the use of hand tools, power tools, or heavy machinery. The Bureau's cultural management activities involve managing sites for scientific, public, and sociocultural use; developing interpretive sites; restricting certain land uses; closing certain areas to exploration; prohibiting some surface disturbing activities; preparing interpretive materials; and allowing the collection of certain invertebrate fossils. The Bureau also seeks listing of eligible sites on the National Register of Historic Places, installs protective fencing of trail

segments, stabilizes deteriorating buildings, acquires access to sites when necessary, performs certain surface disturbing activities, pursues withdrawal of areas from exploration and development of locatable minerals, designates avoidance areas, pursues cooperative agreements, and identifies and interprets historic trails.

Roughly 95 percent of on-the-ground cultural program activity is composed of site surveys in response to proposed activities of other programs. These surveys involve an archeologist walking across the ground in search of artifacts or other cultural features. The remaining Cultural Resources Program (approximately 5 percent) on-the-ground efforts involve data recovery. During the clearance of a site for another program activity, or during another program activity, important cultural resources may be discovered that are deemed worthy of further evaluation. When this occurs, a test or excavation (typically involving less than an acre) may be performed with hand tools, power tools, or heavy equipment that could involve intensive human activity at the site by field crews; placement of crew and evaluation facilities; intense, though usually localized, ground disturbance at the immediate site; and periodic use of primitive access roads and trails. Rarely, a site will have *in situ* interpretive value, and when this is the case, intensive development could occur which might include the construction of permanent access and service roads, power sources, facilities (including protective fencing), and relatively heavy, though usually localized, human use.

Anticipated Effects. Given that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and, if necessary, modifying the action to protect the habitat and/or the species; (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming; and (3) the Bureau has committed to implementing a number of conservation measures to protect this plant (see Appendix); activities associated with the Cultural Resources Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Fire.

Program Description. The three major categories of activities involved with the Bureau's Fire Management Program are prescribed fire, fire suppression, and fire rehabilitation.

Prescribed Fire. During prescribed burning activities, the Bureau evaluates areas on a case-by-case basis, writes fire plans, builds fire breaks, coordinates with all necessary parties and conducts prescribed burns. Prescribed fires are those fires intentionally set and controlled by the Bureau and its cooperators to enhance natural resources in the area. Prescribed fire is also used to dispose of slash and residue from timber sales. Thinning activities are sometimes used to reduce the fuel levels before a prescribed fire. Some prescribed fires are conducted to improve wildlife habitat and grazing potential as well. Prescribed fire is typically used to enhance natural resources in an area by disposing of slash and residue from timber sales and thinning activities, reducing combustible fuel levels, and by improving wildlife habitat and domestic livestock grazing potential.

Prior to conducting a prescribed burn, fuel loads are identified and a burn plan is developed as to how the burn will be conducted and what safeguards must be in place to keep the fire under

control. Vegetation thinning activities are sometimes used to reduce the fuel levels before a prescribed fire. Prescribed fire sites are usually accessed by road. The burn site is typically prepared prior to the actual prescribed fire by construction of firebreaks (often by black lining) and sometimes by creating windrows or piling of fuels to be burned within a firebreak. Fire engines are generally stationed on-site for emergency fire control if needed, and for mop-up operations. Qualified fire personnel conduct the actual prescribed fire operation under stringent guidelines of temperature conditions, humidity, wind speed and ignition sequence which minimizes the chances for the fire to escape. If all site conditions are favorable, and the weather forecast for the time of the burn is favorable, the fuels to be burned are ignited and burned in small increments until desired vegetation of the area is burned. Once the fire appears to have burned out, or is extinguished, the area is monitored to be certain that the fire is indeed completely extinguished and will not start up again or spread to areas not included in the burn plan. The burn area is generally allowed to revegetate naturally, unless conditions require re-seeding, in which case native plant species are seeded or planted. Monitoring continues to determine if the objectives of the project have been met.

Fire Suppression. The fire suppression objectives are to effectively protect life, property, and resource values from wildfire. Full fire suppression will be used on fires endangering human life or fires that come within 0.25 mile of state or private lands, structures and facilities, and oil and gas fields. Limited or modified fire suppression protocols are used in areas where fire may be allowed to function in a more natural manner.

Because fire suppression activities are done on an emergency basis and require great expediency, only minimal preplanning for fire suppression takes place. Similarly, section 7 consultation according to the Act often occurs “after the fact” due to the expediency necessary for wildfire suppression efforts. Recent trends in wildfire occurrence throughout the Wyoming Bureau lands are similar to trends throughout the west, with larger, catastrophic fires in recent years due to past fire suppression and the subsequent increase in fuels. Fire suppression activities can involve the use of off-highway vehicles, hand tools and heavy equipment such as bulldozers. During the construction of a fire line to contain a wildfire, dozers may create a line down to bare soil approximately three feet wide. Chemical fire suppression agents containing chemical dyes may also be used. These may affect the aquatic environment if they enter streams. Water may also be withdrawn from nearby sources such as streams, lakes, or public water supplies to suppress a wildfire.

Fire suppression activities depend on the severity of the fire, the size of the fire, and the resources determined to be in danger. Initial attack of a wildfire would consist of a ground crew (or smoke-jumper crew if the fire was in a remote location) dispatched to the site to evaluate the fire and what suppression requirements that they estimate are needed. Ground access to the site may be by vehicle or on foot using roads, trails, or across-country access. If the fire is small, the crew will immediately extinguish the fire using hand and power tools (e.g., pulaskis, shovels, chainsaws, etc.), and sometimes water from an engine pumper unit, or backpack pumps. If additional fire fighting resources are needed, more personnel and equipment are dispatched to the site. Additional work may include building fire lines by scraping a line down to mineral soil around the fire with hand tools. Hand built fire lines (hand lines) are typically about two feet wide and generally surround the fire perimeter. If the fire increases in size, or burns across the hand line, additional measures may be taken that could include (1) cutting trees, (2) constructing wider fire lines with mechanized equipment, (3) filling water pumper trucks from live waters and spraying the water onto burning vegetation, (4) water drops from helicopter buckets with water

obtained at the nearest source accessible to helicopters, or (5) air tanker drops of chemical retardant which is a slurry consisting of water, chemical fertilizers and a binding agent such as clay. If additional personnel are required to fight the fire, a camp may be established in a safe location close enough to the fire to allow efficient movement of personnel and equipment. Camps may require areas large enough to accommodate personnel, cooking facilities, equipment areas, and storage of supplies needed to suppress the fire. Following containment and control of the fire, "mop-up" operations begin and continue until the fire is declared out (extinguished). Mop-up is a tactic to extinguish burning materials that could cause a fire to spread beyond the control lines. During mop-up operations, all hazardous snags near the fire line or within the fireline are cut down, and all remaining burning embers are extinguished until cold.

Fire Rehabilitation. Emergency Stabilization and Rehabilitation techniques can begin before the fire is determined to be controlled and while fire suppression equipment is still in the fire area. Emergency Stabilization and Rehabilitation techniques could include, but are not limited to: grading, culvert installation, applying mulch, installing straw wattles, contour felling, seeding, fencing for livestock/wildlife management and monitoring and potentially treating weed invasions.

After the fire is extinguished, the area is surveyed for the need to revegetate or rehabilitate any resources damaged by the fire or suppression efforts. An Analysis of Burned Area Emergency Rehabilitation (BAER) is conducted on all fires, and implemented as necessary after considering the extent of the resource damage, the needs of the ecosystem, and public opinion. Rehabilitation involves efforts to repair or improve lands that need to be recovered to a management-approved condition from wildfire damage, or to repair or replace resources damaged by a wildfire. Such activities may include planting small trees and shrubs to reestablish burned habitat, reestablishing native tree species lost in a fire, reseeding grasses and forbs, mulching stream banks, controlling grazing, repairing damage to minor facilities (campgrounds, exhibits, fences, guzzlers, etc.), otherwise restoring habitat, treating invasive plants, maintaining roads/trails, restoring heritage sites, or replacing fences.

Anticipated Effects. Given that (1) prior to any disturbing construction activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and, if necessary, modifying the action to protect the habitat and/or the species; (2) only three populations of this plant is currently known to exist on Bureau-administered lands in Wyoming; (3) there is a low probability for wild fires to occur in the wet, riparian habitat of this species; and (4) the Bureau has committed to implementing a number of conservation measures in occupied habitat (see Appendix); activities associated with the Fire Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Forest Resources.

Program Description. In the resource areas, the Bureau manages its forest resources to maintain and enhance the health, productivity, and the biological diversity of forest and woodland ecosystems, and provide a balance of natural resource benefits and uses, including opportunities for recreation uses, wildlife habitat, watershed values and commercial forest production. The

Bureau's Forestry Program involves a variety of different activities, most of which involve timber harvesting. Other forestry activities involve managing the forest for other uses.

Timber Production. Forest stand inventories are conducted prior to any management activities, and regeneration surveys are performed following stand management activities. During the pre-harvest phase of timber production, the Bureau authorizes the cutting and removal of diseased trees, disease treatment of trees by spraying, and the spraying of grasses and shrubs. The Bureau allows forest stand improvement activities (initial thinning) of young trees (i.e., regeneration growth usually less than 15 feet in height) in forest stands. This activity may or may not require minimal road construction, and the trees are simply laid down with a chainsaw at a set spacing distance and left to decay where they drop. Pre-commercial harvest and removal of diseased trees and pre-commercial thinning of young trees is conducted to reduce the density of smaller trees, and thereby allowing the remaining trees to have better access to available nutrients, water, and light. These activities generally require creation of minimum to light road or two-track trail construction for access, and use of chainsaws and possibly some light yarding equipment for lay down and retrieval of trees

During actual harvesting activities, the Bureau authorizes timber harvesting, permits clearcuts, ensures slash disposal, allows commercial thinning, logging, and skidder-type yarding as well as cable yarding. The Bureau permits the construction of roads and landings for use in timber harvesting operations. During commercial harvest activities, the Bureau allows removal of commercial size trees (i.e., saw logs), ensures slash piling or lop-and-scatter disposal of debris, allows commercial thinning of saw logs under some types of silvicultural treatment, and allows use of both skidder and cable yarding of harvested trees. Generally, light to medium roads are constructed to the harvest stand and yarding areas and load out landings are built in the sale area to facilitate the removal of logs. Trees are laid down with chain saws or harvester machines. Other commercial uses may include post and pole harvest and the removal of wildlings for transplanting purposes. Non-commercial harvest includes the collection and removal of dead and downed trees for firewood and cutting of Christmas trees in stands with good public access. During restoration efforts following timber harvest activities, the Bureau conducts rehabilitation surveys and ensures site regeneration and stand replacement, fencing of regenerated areas, and re-contouring of landings, as needed.

Other Activities. During other forest management activities, the Bureau assesses effects of grazing, manages forests for recreation, livestock grazing, and wildlife habitat and prescribed burning. Additional forest management activities include acquiring easements, pursuing legal access sites, authorizing road development, and installing drain culverts and water bars.

Anticipated Effects. According to the BA (BLM 2005), activities associated with forest resources are not permitted within 200 feet of surface water. Ute ladies'-tresses orchid habitat generally lies within this 200-foot buffer, and therefore, would not be disturbed by activities associated with forest resource management. Additionally, the habitat for this species does not occur in forested areas, so it is unlikely that the species would be found near any timber harvest or other forest-related management activity. For these reasons, the Forest Resources Program is expected to have no effect on the Ute ladies'-tresses orchid.

Geology and Minerals Management

Program Description. The Bureau's Geology and Minerals Programs are divided into three categories. These categories are salable minerals, leasable minerals, and locatable minerals.

Salable Minerals. The mining of salable minerals is authorized under the Materials Act of 1947, as amended, and is a discretionary action of the Bureau. Salable minerals include sand, gravel, sandstone, shale, limestone, dolomite, and granite rock. Historical use of these materials was for building materials, road surfaces, and tools. Today, salable minerals are generally used for maintaining roads and activities associated with the oil and gas industry. The Bureau provides sand, gravel, and stone from federal mineral deposits as necessary to meet the need for federal, state, and local road construction and maintenance projects under this category.

Before issuing contracts or free use permits for salable minerals, the Bureau conducts appropriate environmental assessments. These include special studies or inventories of cultural values, threatened or endangered plant and wildlife species, or other resources. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resource found there and reclamation of the land following project completion. Site reclamation is required following any surface disturbing mining activity for salable minerals. Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes. Reclamation includes removing all surface debris, recontouring, reducing steep slopes, and planting vegetation. All reclamation proposals must conform to State agency requirements and must be approved by the Bureau.

Salable minerals are a resource over which the authorized officer has discretionary authority. The Bureau will prohibit the disposal of salable minerals (including sand) within 0.25 miles of known Ute ladies'-tresses orchid populations (Appendix).

Salable minerals include common variety sand, gravel, stone, sandstone, shale, limestone, dolomite, granite rock, pumice, cinders, clay, and petrified wood. Salable minerals are disposed of under the Materials Act of 1947, as amended, and as such are discretionary actions. Historical use of these materials has been for building materials, road surfaces, and tools. Today, salable minerals are mainly used for maintaining roads, vehicle parking areas, and substrate materials and concrete aggregate, often associated with the oil and gas industry activities. The Wyoming Bureau's policy is to provide sand, gravel, and stone from federal mineral deposits as necessary to meet the need for federal, state, and local road construction and maintenance projects in the Bureau's resource areas.

Sand and gravel may be removed from naturally occurring sites (excluding areas within 0.25 miles of Ute ladies'-tresses populations) generally accessed by using relatively short, unpaved roads. Typically in these operations, the topsoil is removed from the site and stockpiled with earth moving equipment (e.g., bulldozers, front end loaders, or scrapers), the salable mineral material is then extracted from the ground with loaders or mechanized excavators or industrial shovels creating a pit, then the material is processed (i.e., crushed, screened, washed, etc.) at the site, and hauled away in dump trucks or wheeled semi-transporters. Some operations may require the establishment of a quarry with rock cutting machinery and rock handling equipment such as hoists or cranes. Generally, construction of roads to a standard capable of bearing heavy, wide loads is required. Occasionally, water pumping equipment is required at the pit or quarry to keep the operations from becoming flooded, and once in a while transmission lines are extended to the site to provide an electrical power source. It is common to have an office or operations shed located at the site.

Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes, and is a requirement following any surface disturbing. Reclamation includes removing all surface debris, trash, and wastes resulting from extraction operations, recontouring the land surface with heavy machinery where necessary, reducing steep slopes of pits and quarries with heavy machinery such as bulldozers, scrapers, etc. where necessary, replacing topsoil with earth moving equipment, and reestablishing vegetation either by planting or seeding by hand or with farm implement equipment (tractors, discs, harrows, seeders, etc.). Reclamation of disturbed sites is usually done as the operation moves ahead to new deposits.

Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes, and is a requirement following any surface disturbing activity. Reclamation includes removing all surface debris, trash, and wastes resulting from mining operations, recontouring the land surface with heavy machinery where necessary, reducing steep slopes of pits with heavy machinery such as bulldozers, scrapers, etc. where necessary, replacing topsoil with earth moving equipment, and reestablishing vegetation either by planting or seeding by hand or with farm implement equipment (tractors, discs, harrows, seeders, etc.). Reclamation of disturbed sites is often done as the operation moves ahead to new deposits.

Leasable Minerals. Leasable minerals include solid minerals such as coal, uranium and bentonite from acquired lands, and fluid minerals such as oil and gas. Fluid leasable minerals include oil, gas, and coal bed methane.

The Mineral Leasing Act of 1920 provides that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. The Wyoming Bureau has some of the most prolific oil-producing areas in the Rocky Mountains. Once acreage is nominated by the public to be included in an oil and gas lease sale, the acreage is sent to the appropriate Bureau field office via the parcel list to be reviewed and stipulated by the field office for protection of wildlife and other sensitive resources. These stipulations become part of the lease.

Exploration, development, and reclamation are common phases of most leases. Mineral exploration involves opening areas to geophysical (seismic) exploration; permitting the exploration; allowing oil, gas, and mineral development; and leasing and developing oil, gas, and geothermal steam resources. Seismic exploration involves the use of shock waves to describe the mineral structure of the Earth's subsurface. This technology is used to locate reserves of oil and gas resources. Before seismic activity is completed, a Notice of Intent which gives the location and type of activity, and the results of an on-the-ground cultural inventory must be filed. The Bureau conducts an in-office study as well as environmental analysis to determine if any threatened or endangered species will be affected.

Prior to oil and gas drilling activities, an application for permit to drill (APD) must be approved and a site-specific Environmental Assessment (EA) completed for each APD. Drilling operations are inspected regularly as are production facilities. All surface disturbing activities associated with leasable minerals management are subject to no surface occupancy (NSO) restrictions to protect threatened or endangered species habitat. The Bureau has agreed to apply a Condition of Approval (COA) on all Applications for Permit to Drill (APDs), or Control Surface Use (CSU) if applicable, within 0.25 miles of known habitat of the Ute ladies'-tresses orchid, prohibiting all surface-disturbance and OHV activities. Directional drilling may be utilized under the occupied habitat of the Ute ladies'-tresses orchid.

Ancillary development for oil and gas activities involves the construction of roads, pads, and other facilities; and the construction of new above ground powerlines. Stipulations involve implementing leases with no surface occupancy restrictions, seasonal restrictions, or with other standard surface protection restrictions; negotiating mitigated impacts between lessees and authorized officer; deciding mitigation measures and limitations, and reclamation. Reclamation involves correcting any disturbance made by the oil and gas operation. Reclamation activities take place following the expiration of the lease. Reseeding, reshaping, or road destruction are all activities involved with oil and gas reclamation.

Federal oil and gas program activities can be functionally divided into five categories: leasing, exploration (seismic and drilling), development, production (primary, secondary, and tertiary), and closeout/abandonment. Once acreage is nominated by the public to be included in an oil and gas lease sale, the acreage is reviewed and stipulated by the Wyoming State Office for protection of wildlife and other sensitive resources, then notice these lease stipulations are sent to the Field Office for review. If these stipulations are appropriate, they ultimately become part of the issued lease.

Prior to conducting geophysical exploration activity, an NOI which describes the location and type of project, the results of an on-the-ground cultural inventory must be filed Bureau Field office. The Bureau conducts an in-office study as well as environmental analysis, includes an initial determination as to whether any threatened or endangered species will be affected. If necessary, a field exam or survey for threatened or endangered species will be conducted. Most recent seismic activity in the area has been 3-D surveys, with vibroseis and shot hole surveys also allowed. Traditional geophysical exploration operations involve the stringing of vibration sensitive cable geophones in a line across the landscape for a distance of from one to several miles. The geophones are connected to an instrument truck or trailer equipped to gather and record seismic data. A geologic vibration source (e.g., subsurface explosions, ground surface explosions, heavy "thumper" trucks, etc.) is then activated, and the reflected vibrations from the earth's geologic structure are then recorded from the geophone lines. Any surface equipment/instruments and left over trash is then collected, and any surface disturbance (e.g., shot holes) is then reclaimed. Occasionally, geophysical data is collected aerially using instruments capable of measuring the earth's magnetic characteristics.

Prior to conducting site-specific drilling activities, a site specific EA is completed for each APD, or group of APDs. APDs are subject to site-specific conditions of approval which may be more restrictive than lease stipulations. Based on the environmental review, further timing and location restrictions may be added to protect local resources. Once an APD is approved, ground operations may begin. In traditional oil and gas operations, a minimum road capable of handling a well drill rig is constructed to the site, and a level 'pad' ranging in size from 1-5 acres is constructed for drill rig and ancillary facility (e.g., pipe racks, production pits, parking areas, etc.) setup. A drillhole is started (i.e., spudded) and drilling continues until the targeted geologic formation is reached. If a well is not capable of producing economic quantities of oil or gas, it is shut in and plugged and marked and the surface is reclaimed to its previous condition. If a well is a producing well, production facilities (e.g., pipelines and/or storage tanks, water treaters, pipeline compressor stations, powerlines, pumpjacks, fencing, etc.) will be constructed, and road upgrades may occur to accommodate tank trucks used to haul the oil to a terminal or local refinery. Discovery of a producing area may result in additional wells being drilled and a pipeline system established to transport the oil to a storage facility or terminal. If extensive reserves of oil are located field development may occur which would result in additional wells

and transport systems with well spacing determined by the Wyoming Oil and Gas Commission. Drilling and production operations and facilities are inspected and maintained regularly, and varying amounts of human and vehicle activity is present with all the above actions.

When oil and gas wells are no longer capable of producing economic quantities of product, the field is closed out and abandoned. At each well location, all the "down-hole" and surface facilities are removed and the drillhole is plugged. The pad and production pits are reclaimed to existing standards, and a hole marker is placed at the well site. Unnecessary access roads are reclaimed (i.e., recontoured and revegetated). Various types of heavy equipment and vehicles are used for these activities. Finally, the site is inspected, bonds are released as appropriate, and the site is declared closed.

Locatable Minerals. Bentonite, uranium, and gypsum are the principle locatable minerals of Wyoming Bureau Resource Management Areas. Other locatable metallic minerals include silver, gold, platinum, cobalt, and other precious minerals. Actions associated with commercial locatable minerals include surface disturbance for mining, reclamation, and construction of access roads, buildings, and utility lines. Small scale mining may occur in the Bureau areas in Wyoming. All lands must be reclaimed after expiration of a mining lease.

Locatable minerals are those valuable mineral deposits which are not included under the authority of the mineral leasing acts and do not include the common variety salable minerals such as sand, gravel, stone, cinders, pumice, clay, etc. Mining claims, either placer (surface or near surface alluvial or layered deposits) or lode (deeper underground layers, or veins), are staked (i.e., "located") for locatable minerals. All public lands are open to exploration for locatable minerals, except those withdrawn to protect other resource values and uses or those lands with acquired federal mineral status. The Bureau has only limited management authority (i.e., discretion) over mining claim operations. Activities dealing with locatable mineral extraction are generally not subject to many of the special stipulations that are used in the salable and leasable mineral programs to protect sensitive resources from surface disturbance caused by mineral development. Mining claims are typically patented and fee titled, thereby leaving federal government ownership. Locatable metallic minerals (often referred to as 'hardrock') include silver, gold, platinum, cobalt, and other precious minerals. Bentonite (on lands other than "acquired lands"), uranium, and gypsum are locatable minerals.

Locatable mineral exploration and mining activities on Bureau-administered land are subject to the surface management regulations of the Secretary of the Interior in 43 CFR 3809 and, more specifically for Wilderness Study Areas, in 43 CFR 3802. These regulations require an operator to prevent unnecessary or undue degradation of the land. For activities other than casual use, they require the operator to submit either a notice, or a plan of operations and accompanying reclamation plan. Five acres or less of surface disturbance from exploration activities requires a notice to be filed with the Bureau. The notice must describe the proposed activities, the location on the ground, the start-up date, road access and construction, if any, and reclamation measures. Receipt and review of a notice is not a Federal action and approval by Bureau is not required.

A plan of operation must be submitted for exploration greater than five acres, or the production of minerals from any size of disturbance. If a plan of operations is required, it must include a description of the proposed activities, road access and construction, reclamation measures, time frames of non-operation, and a sketch or a map of the area to be disturbed, including all access routes. An EA or an EIS must be prepared by the Bureau or the claimant/operator prior to

commencement of any surface-disturbing activities. A plan of operations must be approved by the Bureau, and operations at the plan level may not commence until the plan is approved. Operators must take such action as needed to minimize or prevent adverse impacts to plants, fish, and wildlife, including threatened and endangered species and their habitat.

Actions associated with locatable minerals mining activities are as varied as the types of mining operations themselves. Typically, initial access roads are constructed to the mine site, and exploratory drilling with vehicle mounted machinery will take place or exploratory pits will be excavated to define the resource boundaries. Most bentonite and uranium is recovered by open pit surface mining operations. Large earth-moving equipment may remove the topsoil and possibly some overburden materials, and place them aside during the actual mining operations. The mineral resource is then removed from the pit with heavy earth moving equipment such as scrapers, loaders, and industrial shovels, and hauled by mine roads to processing and/or load-out facilities, usually at or near the mine site. Various buildings are constructed at the mine site as well as permanent access roads and utility lines. Sometimes railroad lines are built to the mine site to transport the product to market. Following mineral recovery, the mine site is reclaimed and sold or transferred to other uses and purposes. Hardrock minerals are often recovered underground by shaft mining methods. The mining manifestations at the surface may be the presence of access roads or railroads, powerlines, administrative and equipment buildings, rock crushers and mineral processing facilities, and tailings piles at or near the mine. There may also be some mine water production pits and facilities present. Placer operations typically use large shovels or dredges to turn over in-stream and streamside alluvium for sluicing and screening to separate the gravels from the mineral materials. Some placer operations may use high-pressure hydraulic "cannons" to slurry the surface soils and materials into rock crushers, sluicing, and screening equipment for mineral separation.

Reclamation is a requirement following any surface-disturbing activity, even if the claim or site is declared abandoned and void by the Bureau. It is also required if the claimant relinquishes the claim or site to the Federal Government. The Bureau requires a reclamation bond or other financial security prior to the start of surface disturbing operations. Bureau expects the operators to reclaim the lands affected under their notice or approved plan of operations according to the measures stipulated by the authorized officer. All work must be reclaimed prior to bond release from the Wyoming DEQ.

Anticipated Effects to Ute ladies'-tresses. The Bureau's Geology and Minerals Resource Management Programs for the Cody, Kemmerer, Lander, Pinedale, Great Divide, Green River, Worland-Grass Creek, and Worland-Washakie RMPs in Wyoming are not likely to adversely affect the Ute ladies'-tresses orchid because (1) the Bureau has agreed to implement the identified conservation measures and (2) geology and minerals management activities in these resource areas are not expected to occur in habitat for the species. The conservation measures committed to by the Bureau are designed to minimize the effects from Bureau-authorized activities to the Ute ladies'-tresses orchid and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbing construction projects in Ute ladies'-tresses occupied habitat.

Hazardous Materials.

Program Description. The Hazard Management and Resource Restoration (HMRR) Program objectives are to protect public and environmental health and safety on Bureau-administered public lands, comply with federal and state laws, prevent waste contamination due to any

Bureau-authorized actions, minimize federal exposure to the liabilities associated with waste management on public lands, and integrate hazardous materials (HAZMAT) and waste management policies and controls into all Bureau programs. Generally, the program responsibilities are divided into the categories of: hazardous waste management; hazard management; emergency response; liability and risk management; and program support. The most likely hazardous material sources in the Wyoming resource areas may be from illegal dumping, oil and gas field contaminants, mine tailings, abandoned waste, and unplanned or accidental spills.

By their very nature, most HAZMAT sites are located near some form of existing road, two-track trail, or other physical access. HAZMAT sites may take a variety of forms (e.g., landfills, methamphetamine labs, industrial dumps, mine sites, etc.), but probably the most prevalent, and in some cases difficult to deal with, involve unauthorized dumps. Because dumps are a result of unregulated activity, it is generally unknown what materials may be buried in them. In some cases, the Bureau monitors dumps by surrounding the site with monitoring wells to determine if any hazardous materials are escaping or migrating away from the site. This operation could involve the use of small drill rigs and water trucks, etc. If materials are escaping, then a variety of other containment and/or clean-up measures may be necessary, including digging up the site with excavators and other heavy machinery, removal of the hazardous material, and reclamation of the site.

When an unplanned or accidental spill of hazardous materials occurs on Bureau-administered lands, an immediate, emergency investigation of the site is conducted by Bureau HAZMAT specialists and law enforcement personnel to determine if a regulatory violation has occurred, and to evaluate the site for its toxicity, flammability, reactivity, and corrosiveness, and to assess the necessity of clean up actions. The site is then generally, isolated temporarily from public access. An emergency contractor is dispatched to the site. Then, whatever necessary site clean up and reclamation is performed. Clean up operations may require the use of heavy equipment such as hoists, cranes, transport trucks, bulldozers, earthmovers (i.e., scrapers), tractors, disks, or seeders.

If hazardous materials are identified as part of a permitted or authorized activity, the management of those materials may be monitored during the time period they are being used. If an accidental release of a hazardous material occurs the removal and clean up of the material will be monitored to ensure no future hazard will remain on the site. In some spill cases, this may involve construction of earth berms to contain the material and removal of contaminated soil to a proper disposal or treatment facility. If ground disturbance occurs, rehabilitation of the site will be required.

Anticipated Effects. Only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming. Also, hazardous material program activities are rare on Bureau-administered lands in Wyoming and highly unlikely to occur in occupied Ute ladies'-tresses habitat. Therefore, activities associated with the Hazardous Materials Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas.

Lands and Realty.

Program Description. The Lands and Realty Program authorizes and responds to requests for land use authorizations, sales, exchanges, access acquisitions, and other activities.

Rights-of-Way. Rights-of-way (ROW) authorizations allow the use, or passage over, of public lands to get to, from, or through a location, or to allow the construction of a facility such as a utility line. ROWs granted by the Bureau may include access roads, pipelines, communication sites, irrigation ditches, and electrical distribution lines associated with oil and gas wells and production facilities.

ROWs may be temporary (such as haul roads used while timber sales are in progress) or extended (such as for a public highway or electric transmission line). When roads are authorized on public land, the ROW is written to include stipulations so that the road design must follow accepted Bureau road engineering standards. The Bureau road engineering standards are designed to provide for the safety of users of the roadway as well as to avoid environmental degradation.

All public lands, except some withdrawals and ACECs, are available for ROW authorizations. Most ROWs are granted for access roads, pipelines, and electrical distribution lines associated with oil and gas wells and production facilities. If a ROW is no longer needed, constructed facilities are removed and any reclamation needed such as contouring or reseeding is done before the ROW is relinquished.

Temporary Use Permits. All public lands, except some withdrawals and ACECs, are available for issuance of temporary use permits (TUPs). TUPs can be issued for activities that usually have a short and definite time period of use, such as for a training area for military use. When the temporary use of the area is complete, the site is evaluated, and, if needed, reclamation work is done prior to the temporary use permit being closed. TUPs can be issued for a wide variety of uses. In the past, TUPs have been issued for staging areas for U.S. Army National Guard training exercises and for “rendezvous” sites for primitive weapons club gatherings that included camping areas, commons areas, event locations and temporary sanitation sites. Impacts from activities such as these are minor and short term, with any disturbance returned to its natural condition at the end of the authorization.

Sales/Exchanges. Land tenure adjustments include land sales, exchanges, and, rarely, purchases. Land sales and exchanges take place to facilitate management or acquire lands with special attributes that would enhance the operation of one or more of the programs that the Bureau carries out, or as a response to a request from a private landowner or company. All land tenure adjustments must be determined to be in the public interest before they can be authorized. In some cases, land tenure adjustment could result in increased access and, thus, increased human activity in areas that previously may not have had a high level of human use. Lands exchanged out of public ownership may be developed by the landowner to meet his needs, or at some point in the future, be sold again to another party and developed or used according to their needs. Lands disposed from federal ownership could ultimately go to any use; lands acquired to federal ownership (i.e., Bureau administration) would be managed as any other lands for the purposes for which they were acquired.

Access Acquisition Efforts. Access acquisition needs (typically for roads) are most commonly identified for public access for recreational use. This may be for hunting, sightseeing, rockhounding or general exploring. Acquisition of access to public lands has been identified in locations that would provide the public with an opportunity to utilize resources that have previously been unavailable because the public lands had no public access. An increase in access could result in an increase in human activity in an area that previously had little activity,

development of roads, trails, parking areas and other facilities to enhance the public's use of the area. These construction activities could lead to the use of heavy equipment and machinery, as well as surface disturbance at the site.

Other. Other activities under the Lands and Realty Program include processing stock driveway withdrawals and locatable mineral entry withdrawals, establishing protective withdrawals, and developing stipulations. The Bureau also pursues cooperative agreements, develops recreation site facilities, considers offsite mitigation; minimizes access in wildlife habitat, fences revegetation sites, blocks linear rights-of-way to vehicle use, and leases acres for landfills. Withdrawals are used to preserve sensitive environmental values, protect major federal investments in facilities, support national security, and provide for public health and safety. They segregate a portion of public lands and suspend certain operations of the public land laws, such as desert land entries or mining claims. Land withdrawals can be used to transfer jurisdiction to other federal land-managing agencies.

Anticipated Effects. Given (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005), (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming, (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix), and (4) there is a low probability for lands and realty actions to occur in the wet, riparian habitat of this species therefore, activities associated with the Lands and Realty Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Off-Highway Vehicle use.

Program Description. Recreational OHV use (including over-the-snow vehicles) on public lands is that use taking place off of the paved highways and thoroughfares. OHV use does not refer to other forms of mechanized transportation (e.g., bicycles, carts and wagons, etc.). To limit the impacts caused by OHV use on public lands, the Bureau places OHV use into three regulatory categories: (1) lands closed to OHVs; (2) OHV use limited to existing roads and trails; and (3) lands open to all OHV use. Most of the Bureau-administered public lands are designated in the category of "limited to existing roads and trails" for OHVs, with the exception of necessary tasks (such actions as project inspection and maintenance, retrieval of game during hunting seasons, fire fighting activities, and other emergency uses). Seasonal restrictions may be applied in crucial wildlife habitats as needed. In addition, OHVs are prohibited on wet soils.

Anticipated Effects. Given that only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming and it is the Bureau's policy to not allow OHV use on wet soils and riparian areas, the OHV program is expected to have no effect on Ute ladies'-tresses orchids in all Wyoming Bureau resource areas.

Paleontological Resources.

Program Description. The objective of paleontological resources program is to manage paleontological resources that are part of the Bureau-administered public land surface estate for their informational, educational, scientific, public, and recreational uses.

Using the land for scientific purposes such as paleontological exploration is authorized through a permit system. Fossils are part of the surface estate, such that whoever owns the surface consequently owns the fossils. A paleontological collecting permit is required before collecting any fossil vertebrates, significant fossil invertebrates, and plants on Bureau-administered public lands.

Potential effects on paleontological resources on Bureau-administered public lands are considered in site-specific environmental analyses before authorizing surface-disturbing activities. Site-specific inventories are required where significant fossil resources are known or are anticipated to occur. Hobby collection of invertebrate fossils and petrified wood are allowed except in specified areas. The closing of Bureau-administered public lands or restricting uses to protect paleontological resources are evaluated case-by-case.

Anticipated Effects. In looking at anticipated effects, we considered that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species; (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming; (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix); (4) there is a low probability for paleontological resources to be found in Ute ladies'-tresses habitat (BLM 2005); and (5) when paleontological resource activities do occur, they only disturb a small amount of land surface. Therefore, activities associated with the Paleontological Resources Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Recreation Resources.

Program Description. Recreation management activities include allowing recreational access and use by the public, developing recreational areas and campsites, imposing restrictions, acquiring recreational access, and assessing effects of recreational use to the environment. Recreational activities allowed by the Bureau include hiking, hunting, mountain biking, dog walking, wildlife viewing, cross-country skiing, boating, and fishing, horseback riding, and camping. Large recreational events may include organized group hikes or horse endurance rides. Recreational land and access acquisition activities involve maintaining public access, pursuing rights-of-way, providing continued access, and pursuing land acquisition. Recreational site development includes maintaining or developing recreational sites and facilities, developing campgrounds, providing fishing and floating opportunities, maintaining developed and undeveloped recreational sites, adding developments as opportunities arise, adding interpretive markers, and constructing roads and interpretive sites. Development and enforcement of stipulations/protective measures includes enforcing recreation-oriented regulations, patrolling high-use areas and contacting users in the field. The Bureau places boundary signs, identifies hazards on rivers, restricts recreational uses; with some exceptions, limits motorized vehicles to existing trails, designates road use and recreation areas, requires facilities to blend with the natural environment, and conducts field inventories. There is the potential for recreational activities to occur year-round in Wyoming Bureau resource areas.

The types of recreational use found in the resource areas can be categorized as (1) concentrated and developed, (2) dispersed, (3) water based, and (4) off highway vehicle (OHV) use (OHV-use is discussed separately under its own program). According to the RMPs, development of additional recreational and camping sites will be pursued in the resource areas, as needed. Prior to the development of any recreational use area such as a trail or campsite area, a site specific environmental analysis (EA) will be done to identify any conflicts or protective stipulations that may be required. Camping areas will be in the primitive-but managed category, providing only trash receptacles and fire rings. These will be established in areas historically used by campers (typically near streams or in wooded areas) to control access and litter and provide a safe area for campfires. Little or no road construction would occur, and what little did take place would be only to minimum engineering standards. Some light equipment and vehicles would be used during construction and maintenance activities.

Many recreational uses are authorized on public lands that do not require a permit or notice of use (referred to as independent, non-commercial, or casual recreational use), including hiking, sightseeing, rockhounding, photography and nature study. The Bureau has little or no “control” or authorization discretion over these casual use activities.

Activities associated with dispersed recreation are varied and may include walking across the land, shooting of firearms or primitive weapons, use of optical equipment, use of hand held and portable collecting tools, mechanized travel on existing roads and trails. Placement of signs to manage recreation may occur, but would have minimal surface disturbing impacts. No significant surface disturbance of the land is expected with these activities. Although there are no designated recreational waterways for canoeing, kayaking, floating, or boating, these activities do occur in the resource areas. Other activities commonly associated with water based recreation include fishing from streambanks or lakesides, accessing streams and lakes by vehicle, launching watercraft, and boating in stream channels or lakes. There is generally very little surface disturbance occurring with these activities, although in some instances short access roads could be constructed, or boat launch site might be constructed on streambanks or lakesides. The primary environment-impacting activities associated with these activities are the noise and commotion associated with human movement and exertions.

Anticipated Effects. In evaluating anticipated effects, we considered that (1) prior to authorizing any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species, (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming, (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix), and (4) there is a low probability for authorized recreation activities to occur in the wet, riparian habitat of this species (BLM 2005). Therefore, activities associated with the Recreation Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures (Appendix) are designed to limit project-related ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Riparian Areas.

Program Description. The objectives for the Bureau's Riparian Areas Management Program are to maintain, improve, or restore riparian value to enhance forage, habitat, and stream quality. Priority for riparian areas management is given to those areas identified as Colorado River cutthroat trout habitat.

Riparian areas management is an integral part of all resources and related management programs. Management actions may include reductions in livestock numbers, adjustments in grazing distribution patterns, fencing, herding, and livestock conversions. Those activities that affect or are affected by riparian values, will take into account the riparian areas management objectives and direction. Resource values and uses that affect or are affected by riparian values include wildlife and fisheries habitat, forest resources, livestock grazing, OHV use, visual resources, cultural and historical resources, minerals exploration and development activities, lands and realty activities, watershed and soils resources, recreation uses, fire management, and access. Laws and guidelines abided by during riparian management include Executive Orders 11990 (wetland) and 11988 (floodplain), and section 404 of the Clean Water Act.

Anticipated Effects. In evaluating anticipated effects, we considered that (1) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming, (2) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix), and (3) management actions associated with the Riparian Areas Program are expected to have only beneficial effects on riparian areas. Therefore, activities associated with the Riparians Areas Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Sensitive Plants.

Program Description. The objective for sensitive plants management is to maintain and enhance known populations of sensitive plant species within Bureau-administered public lands. As habitats or sites for any future listed species are identified within Bureau resource areas, the Bureau is committed to developing protective measures for these in cooperation with the Service (BLM 2005).

The known populations of sensitive plant species will be protected from disturbance by maintaining or establishing fencing around the populations, and by intensively managing surface disturbance in adjacent areas that could affect the populations. Any proposed surface disturbance will be examined on a case-by-case basis to determine potential adverse effects and appropriate mitigation to minimize those effects. Developments, uses, and facilities will be managed temporally and spatially to avoid damage to the sensitive plant species.

Anticipated Effects. In evaluating anticipated effects, we considered that (1) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming, (2) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix), and (3) management actions associated with the Sensitive Plants Program are expected to have only beneficial effects on sensitive plant populations. Therefore, activities associated with the Sensitive Plants Program are not likely to adversely

affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Soils.

Program Description. The Bureau performs a variety of activities designed to preserve and protect soil. Through the Bureau's Soils Program, the Bureau evaluates proposed projects, applies soil management practices, applies seasonal closures, and completes ground water studies. Some of these field activities involve the use of heavy machinery and hand tools. Field activities can involve developing riparian exclosures or constructing stream crossings. Other activities can involve imposing restrictions on activities such as mineral exploration and development, pipelines, powerlines, roads, recreation sites, fences, and wells.

Activities associated with soil mapping/sampling may include surveying, core drilling, use of pick-up truck mounted soil augers and core samplers (1.5 to 2 inches in diameter) and back-hoes (usually around 12 to 24 inches in width and pits may be up to 6 feet deep) for digging soil characterization pits and trenches, using hand held shovels to dig holes or pits, and associated human and vehicle disturbances. These trenches are backfilled and revegetated/reseeded when surveys are complete. Disturbances are usually very small and the vegetation quickly regenerates there. Surface soil erosion studies may also be conducted. These soil resource related activities in the Bureau resource areas are mainly in support of other programs. Soil mapping and identification requires the digging of trenches to identify and measure soil horizons below the surface. Other activities associated with soil resources may include reclamation of abandoned mine lands and open shafts, removal of waste rock in floodplains or streams, or cleanup of tailings. These reclamation programs are covered under the hazardous materials section of this document.

Anticipated Effects. Management activities of this program within the resource areas are expected to maintain or may improve the characteristics of soil characteristics at Ute ladies'-tresses sites. In evaluating anticipated effects, we considered that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species, (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming, (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix), and (4) management actions associated with this program are expected to have only beneficial effects to soil resources and Ute ladies'-tresses habitat (BLM 2005). Therefore, activities associated with the Recreation Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Surface Disturbance Restriction Decisions.

Program Description. The Surface Disturbance Restriction Decisions Program is intended to protect certain sensitive resources and areas from adverse effects of surface-disturbing activities

and human presence. Surface disturbance restrictions apply to all types of activities involving surface disturbance or human presence impacts and are applied in accordance with the guidelines described in the Wyoming Bureau Standard Mitigation Guidelines for Surface-Disturbing Activities (SDA Guidelines). The SDA Guidelines include, where applicable, proposals for waiver, exception, or modification, based on analysis for individual actions. This allows for situations where a surface-disturbing activity may actually benefit sensitive resources, and allow for those occasions when analysis determines that an activity will not affect those resources.

The SDA Guidelines are used to condition development activities in all programs where surface-disturbing activities occur and where the objectives of the RMPs include the protection of important resource values. On a case-by-case basis, activities are conditioned by any one or more of the mitigations in the SDA Guidelines to avoid or minimize impacts to other important resource values and sensitive areas. Use restrictions (e.g., dates and distances) may be made more or less stringent, depending on the needs of specific situations. Additional restrictions may be placed on surface-disturbing activities as necessary.

The mitigations identified in a particular RMP serve to provide a degree of protection to affected resources, not to unnecessarily restrict activities. RMPs provides the flexibility for modifications or exceptions to restrictions in specific circumstances where a restriction is determined not to apply or is not needed to achieve a desired objective.

Surface disturbance is characterized by the removal of vegetative cover and soil materials. Where actual excavation does not occur, activities may be allowed to occur with less stringent limitations provided that the objectives and purpose for the surface disturbance restrictions are met. Examples where less stringent application of the SDA Guidelines would apply are timber harvesting within 500 feet of streams or riparian areas and on slopes greater than 25 percent. This would be applicable to those timber harvest activities, such as tree cutting, skidding, and slash disposal that do not fully remove vegetative cover and soil materials. In the past, allowing these activities with a 100-foot streamside buffer distance and on slopes greater than 25 percent did not produce detrimental effects. However, road construction or staging/loading areas for logging equipment would not meet the less stringent definition and would be subject to the standard requirements of 500 feet and 25 percent slope.

The mitigations prescribed for federal mineral development on split estate lands (federal minerals beneath a non-federal surface) apply only to the development of the federal minerals. These mitigations do not dictate the surface owner's management of their lands. The mitigations present restrictions on only those surface activities conducted for purposes of developing the federal minerals and that are permitted, licensed, or otherwise approved by the Bureau.

Anticipated Effects. In evaluating anticipated effects, we considered that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid and, if necessary, will modify the action to protect the habitat and/or the species, as well as implementing a number of conservation measures to protect this plant and its habitat (see Appendix)(BLM 2005); and (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming; therefore, activities associated with the Recreation Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce

adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Threatened, Endangered, and Candidate Species Protection.

Program Description. The management objectives of threatened, endangered and candidate species protection are to maintain biological diversity of plant and animal species by supporting Wyoming Game and Fish Department (WGFD) strategic plan population objective levels to the extent practical and consistent with the Bureau's multiple-use management requirements. It maintains and improves forage production and quality of rangelands, fisheries, and wildlife habitat and provides habitat for threatened and endangered and special status plant and animal species on all public lands in compliance with the Act and approved recovery plans.

The Bureau's threatened and endangered species management activities include protecting habitat and known populations, enforcing timing stipulations, conducting surveys, and closing known locations of sensitive populations or habitat to surface-disturbing activities.

Anticipated Effects. Management activities of this program within the Bureau resource areas are expected to maintain or may improve the conditions for threatened, endangered, and candidates species. Given that: (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species; (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming; (3) the Bureau has committed implementing a number of conservation measures to protect this plant and its habitat (see Appendix); (4) management actions associated with this program are expected to have only beneficial effects to threatened and endangered species (BLM 2005) therefore, activities associated with the Threatened, Endangered, and Candidate Species Protection Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Vegetation Resources.

Program Description. Vegetation resource management is intended (1) to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources, (2) to enhance essential and important habitats for special-status plants species on Bureau-administered public land surface and prevent the need for any special-status plant species being listed as threatened and endangered, and (3) to reduce the spread of noxious weeds.

During vegetation management activities, the Bureau maintains or improves the diversity of plant communities. In addition, vegetation management activities support livestock grazing, wildlife habitat management, sensitive species management, prescribed fire, timber production, watershed protection, visual resources, and the reduction in the spread of noxious weeds. As part of vegetation management, the Bureau designs vegetation treatments; conducts prescribed burns; implements weed control programs; plants trees; allows pre-commercial tree thinning; provides buffer zones; allows the use of machinery or fire; improves riparian habitat; pursues the acquisition of additional riparian areas; allows spraying, burning, and mechanical disturbances;

uses species-specific insects, livestock grazing, mechanical methods, or chemical methods to modify composition and diversity of vegetation; and conducts plant species surveys.

Anticipated Effects. Management activities of this program within the resource areas are expected to maintain or may improve the conditions for vegetation resources. In evaluating anticipated effects, we considered that (1) prior to any construction activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species; (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming; (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix); (4) management actions associated with this program are expected to have beneficial effects to vegetation resources and Ute ladies'-tresses habitat; and (5) the commitment by the Bureau to prohibit biological control of weeds in known locations of Ute ladies'-tresses habitat until the impact of the control agent has been fully evaluated and determined to not adversely affect the plant population (BLM 2005). Therefore, activities associated with the Vegetation Resources Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Visual Resources.

Program Description. The objective of visual resources management is to maintain or improve scenic values and visual quality, and establish visual resources management priorities in conjunction with other resource values. Visual resources are managed in accordance with objectives for visual resources management classes that have been assigned to each Bureau resource area. Visual resource classification inventories have been developed for some, but not all, of the areas in Wyoming. To improve visual resources, the Bureau designs facilities to blend in with the surroundings, reclaims watershed projects and water wells, regulates discharge of produced water, and restricts activities that might degrade visual resources.

No activity or occupancy is allowed within 200 feet of the edge of state and federal highways. Facilities or structures such as power lines, oil wells, and storage tanks are required to be screened, painted, and designed to blend with the surrounding landscape, except where safety indicates otherwise. Any facilities or structures proposed in or near wilderness study areas will be designed so as not to impair wilderness suitability.

Anticipated Effects. Management activities of this program within the Bureau resource areas are expected to maintain or may improve the conditions for Ute ladies'-tresses. In evaluating anticipated effects, we considered that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species; (2) only three populations of this plant is currently known to exist on Bureau-administered lands in Wyoming; (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix); and (4) management actions associated with this program are expected to have only beneficial effects to Ute ladies'-tresses populations and habitat (BLM 2005). Therefore, activities associated with the Visual Resources Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas.

The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Watershed and Water Resources.

Program Description. Through water resource management the Bureau seeks to maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards, provide for the availability of water to facilitate authorized uses, and to minimize harmful consequences of erosion and surface runoff. Water resources are also to be protected or enhanced through site-specific guidelines. The Bureau develops pollution prevention plans, ensures rights to water-related projects are filed, delineates no chemical use buffer zones, designs activities to promote reduction of channel erosion, and restores damaged wetlands or riparian areas. The Bureau also provides technical expertise on other activities such as livestock ponds, stream monitoring, waterfowl monitoring activities, reestablishes floodplains, and provides impact analyses of oil and gas development or any surface disturbance projects.

Anticipated Effects. Management activities of this program within the resource areas are expected to maintain or may improve the conditions for Ute ladies'-tresses. In evaluating anticipated effects, we considered that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005); (2) only three populations of this plant are known to exist on Bureau-administered lands in Wyoming; (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix); and (4) management actions associated with this program are expected to have only beneficial effects to Ute ladies'-tresses populations and habitat (BLM 2005). Therefore, activities associated with the Watershed and Water Resources Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities; reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

Wild and Scenic Rivers.

Program Description. The objectives of wild and scenic rivers management for public lands administered by the Bureau that meet the wild and scenic rivers suitability factors is to maintain or enhance their outstandingly remarkable values and wild and scenic rivers (WSR) classifications until the U.S. Congress considers them for possible designation. Wild and Scenic Rivers Management activities of the Bureau include studying segments of the river for potential classification by Congress. The suitable determination is based on the uniqueness of the diverse land resources and their regional and national significance, making them worthy of any future consideration for addition to the WSR system.

Anticipated Effects. As there are no Wild and Scenic Rivers on Bureau-administered lands in Wyoming and activities involved with this program are not expected to occur in Ute ladies'-habitat, therefore it is anticipated that this program will have no effect to the Ute ladies'-tresses orchid in Wyoming.

Wild Horse.

Program Description. The management objective of wild horse management is to maintain viable herds that will preserve the free-roaming nature of wild horses in a thriving ecological balance and to provide opportunity for the public to view them. Wild horse and burro populations have more than tripled since passage of the Wild and Free Roaming Horse and Burro Act in 1971, and horse numbers on Bureau lands in the West were estimated at more than 60,000 as compared to 17,000 in the late 1960's.

Through its Wild Horse Program, the Bureau authorizes herding, corralling, transporting, monitoring, and otherwise rounding up wild horses. Herds are monitored by airplane census and counted each year. Helicopters may also be used to round up wild horses. Through planning processes, the Bureau decides how many wild horses to allow on a certain area. This is termed the Approximate Management Level and the Bureau can reduce horse numbers as needed. Issues taken into consideration include carrying capacity, trends in utilization, and public input. The Bureau's wild horse management specialists coordinate with other Bureau staff to minimize impacts to other resources. Excess wild horses are distributed throughout the country by an adoption process or may be placed in wild horse sanctuaries.

Anticipated Effects. Currently, there are no wild horse herds in areas occupied by Ute ladies'-tresses populations known to occur in Wyoming. The possibility does exist that Ute ladies'-tresses populations may be discovered in the future in Bureau-administered areas occupied by wild horses. Unlike cattle, wild horses are not "contained on individual grazing allotments". Rather, wild horses are of a "free-roaming nature" and their individual grazing activities are not Bureau-discretionary actions just as the activities of deer and elk are not Bureau-discretionary actions. The Bureau has agreed to not perform herding, corralling and transporting of wild horses in areas occupied by Ute ladies'-tresses populations. As such, activities authorized under the Bureau's wild horse program are expected to have no effect on Ute ladies'-tresses populations in the State (BLM 2005).

Wilderness Resources.

Program Description. The Bureau wilderness program is intended to manage and retain the wilderness quality of wilderness study areas (WSAs). Discretionary uses within or adjacent to WSAs are reviewed to ensure that they do not create conflicts with management and preservation of wilderness values. A wilderness is recognized as "an area where the earth and its community of life are untrammled by man, where man himself is a visitor who does not remain." An area of wilderness is further defined as "an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Wilderness Act, 16 U.S.C. 1131-1136).

Activities associated with this program may include inventories to identify wilderness areas, public involvement with the wilderness study process, authorization of mining claims under unique circumstances, or evaluations of proposed actions to identify potential impacts to known or potential wilderness values.

Anticipated Effects. As there are no known Ute ladies'-tresses populations on areas that are managed under the wilderness management program, this program is anticipated to have no effect to the Ute ladies'-tresses orchid. If populations were found in these areas, the Bureau is committed to insure that proper protective measures are put in place to avoiding impacting the species (BLM 2005).

Wildlife Habitat.

Program Description. Through wildlife habitat management, the Bureau in Wyoming seeks to maintain biological diversity of plant and animal species and supports the Wyoming Game and Fish Department strategic plan population objective levels. To accomplish this, the Bureau maintains and improves forage productions and quality of rangelands, fisheries, and wildlife habitat; and provides habitat for threatened, endangered, and special status animal and plant species on Bureau-administered public land surface in compliance with approved recovery plans.

Approximately 90 percent of wildlife program activities are in support of other resource programs such as fuels reductions, density of timber stands in deer and elk winter habitats, oil and gas exploration, timber harvest, or prescribed fires. Wildlife and fisheries management program activities may include: surveying, monitoring, habitat improvement activities, developing habitat management plans, creating cooperative management areas, developing stipulations and protective measures, acquiring land and easements, conducting inventories, and performing livestock or forestry related activities. The Bureau develops stipulations and protective measures including the authorization of withdrawals from some areas from mineral entry, limiting access of 4-wheel drive vehicles, snowmobiles, horseback riders, and pedestrians, prohibiting surface development, and imposing road closures. Livestock-related wildlife management activities include the development of water sources; construction and maintenance of fences; the management of other resource activities to conserve forage and protect habitat; the improvement of forage production and quality of rangelands; and the improvement of range with mechanical treatment. Forestry-related wildlife management activities include the management of timber and the promotion of cutting, thinning, planting, and seeding. Other wildlife management activities include monitoring habitat, using prescribed burning; developing islands; managing accesses; authorizing agricultural entry and disposal; using surface protection mitigation; constructing artificial structures; using heavy equipment and hand tools; documenting resource damage; improving aquatic and riparian habitat; developing cooperative agreements to facilitate species transplants; chemically controlling pests, and exotic fish removal.

Anticipated Effects. Management activities of this program within the resource areas are expected to maintain or may improve the conditions for wildlife species. In evaluating anticipated effects, we considered that (1) prior to any disturbing activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species, (2) only three populations of this plant are currently known to exist on Bureau-administered lands in Wyoming, (3) the Bureau has committed to implementing a number of conservation measures to protect this plant and its habitat (see Appendix), and (4) management actions associated with this program are expected to have beneficial effects to Ute ladies'-tresses habitat through habitat protective measures (BLM 2005). Therefore, activities associated with the Wildlife Program are not likely to adversely affect the Ute ladies'-tresses orchid in all Wyoming Bureau resource areas. The conservation measures are designed to limit ground disturbance and other potentially-impacting activities; ensure productive soils; restore, maintain, or improve plant communities;

reduce the likelihood of weed introductions; reduce adverse impacts from livestock; and ensure the proper control of weeds and pests within Ute ladies'-tresses habitat.

This concludes informal consultation requirements pursuant to the regulations implementing the Act, 50 C.F.R. §402.13. This action should be re-analyzed if new information reveals effects of the action that may affect listed or proposed species or designated or proposed critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to a listed or proposed species or designated or proposed critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this action.

The following BO addresses potential adverse effects to the Ute ladies'-tresses orchid from livestock grazing in all of the Bureau's resource areas and from coal bed methane development in the Platte River and Buffalo Resource Areas.

PROGRAMMATIC BIOLOGICAL OPINION

FOR THE

WYOMING BUREAU OF LAND MANAGEMENT'S

RESOURCE MANAGEMENT PLANS

WITH BUREAU-COMMITTED

CONSERVATION MEASURES

AND THE EFFECTS TO THE

UTE LADIES'-TRESSES ORCHID (*Spiranthes diluvialis*)

**U.S. Fish and Wildlife Service
Wyoming Ecological Services Office
Cheyenne, Wyoming**

April 2007

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PROGRAMMATIC BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action examined in this consultation is the continuation of management according to the existing Wyoming Resource Management Plans (RMP) as well as the Bureau's commitment to conservation measures listed in the Biological Assessment (BLM 2005). The conservation measures are listed in the Appendix. The RMPs are used by the Bureau to guide and control future actions and set standards upon which future decisions on site-specific activities are based. The RMPs only establish general management policy on a broad scale. They are not used to make decisions that commit resources on a small scale such as on specific parcels of land. The RMPs also identify desired outcomes, also known as "desired future conditions". These outcomes are expressed in the RMPs as goals, standards, objectives, and allowable uses and actions needed to achieve desired outcomes. These are often referred to as RMP decisions or resource allocations. It is upon these RMP decisions or resource allocations and Bureau-committed conservation measures that the effects determinations in this Biological Opinion are based.

Until revised, the Wyoming RMPs have been and will continue to be used by the Bureau, in conjunction with the conservation strategy listed in the BA, to guide and control future actions and set standards upon which future decisions on site-specific activities will be based. This consultation only addresses the potential effects of the Wyoming RMPs as of the date of this BO.

As per section 7 of the Endangered Species Act of 1973 (Act), as amended (50 CFR §402.13 and §402.14), the Bureau will conduct site-specific consultation with the Service prior to authorization of any actions authorized under the Wyoming RMPs which "may affect" the Ute ladies'-tresses orchid (*Spiranthes diluvialis*). These future consultations will provide a means for site-specific analysis and documentation of impacts to the Ute ladies'-tresses orchid.

The RMPs incorporate current laws and regulations and public land resource management initiatives to guide long-range land management decisions for public lands and resources in all counties except Park county in Wyoming. The RMPs do not include land management decisions where land surfaces and minerals are both privately owned, or owned by the State of Wyoming, or local governments, or those lands that are managed by other federal agencies.

A description of activities of the Wyoming RMPs that may affect, and are likely to adversely affect, the Ute ladies'-tresses orchid is contained in the Statewide Programmatic Ute ladies'-tresses BA (BLM 2005) and is described below.

Description of Activities Described under the Statewide Programmatic Ute ladies'-tresses BA that may affect and are likely to adversely affect the Ute ladies'-tresses orchid

The following discussion describes the Wyoming Bureau's Livestock Grazing Programs which may have potential adverse effects to the Ute ladies'-tresses orchid. A conservation strategy was included in the Bureau's BA (BLM 2005) to address potential adverse effects. The Bureau has committed to implementing the conservation measures listed in that conservation strategy as part of its proposed action (RMP) (see Appendix), therefore, the Service has evaluated the implementation of these conservation measures as part of the proposed action.

Table 1. Ute ladies'-tresses "likely to adversely affect" determinations made by the Bureau.

Resource Management Plan / Program Type	Buffalo	Platte River	Cody	Kemmerer	Lander	Pinedale	Great Divide	Green River	Worland-Grass Creek	Worland-Washakie
Livestock Grazing	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA
Geology and Minerals	LAA	LAA	-----	-----	-----	-----	-----	-----	-----	-----

Livestock Grazing.

The livestock management objective for the resource areas is to maintain or improve forage production and range condition and to provide a sustainable resource base for livestock grazing on public lands while improving wildlife habitat and watershed conditions. Grazing is authorized on most of the Bureau-administered lands in the resource areas.

A typical grazing parcel on Bureau-administered land within the resource areas may be permitted on a yearlong use basis with the amount of allowable forage identified as Animal Unit Months of use or AUM's. The livestock operator may, with concurrence from the Bureau, change the use pattern from year to year to compliment healthy rangelands, depending on the available forage, condition of the pasture and weather conditions, or to achieve pre-determined management goals. Livestock grazing patterns are found in Table 2. Permits are normally issued for a 10-year period. If Bureau personnel identify a need for specific management or a change in the current pattern of use, this can be stipulated on the permit when it is re-authorized. Cattle are the predominant class of livestock grazed on Bureau-administered lands in the resource areas, however, sheep, horses and bison are also authorized in some allotments.

Program Description. Categories under the Livestock Grazing Management program include (1) livestock management activities, (2) range management, (3) fencing, (4) predator/pest management, (5) water management, (6) detrimental impacts management, and (7) lease management.

Livestock Management. Most livestock operators use off-highway vehicles (OHVs) (pick-up trucks, 4-wheelers, motorcycles), ride horseback, or walk to access their allotments. "Herding" (moving) livestock by walking, horseback riding, and the use of dogs to distribute livestock on allotments or trailing (move them from one location to another - on or off of allotments), and the use of domestic sheep bed grounds (a temporary site to bed down flock(s) of sheep) and associated sheep herder camps are commonly employed methods of livestock operations. Another method that livestock producers can use to change the distribution of livestock is to provide salt or mineral supplements in specified areas.

Range Management. Range management activities include using prescribed fire, vegetation manipulation projects, changing composition of existing vegetation, using noxious weed control, using mechanical or biological vegetative treatments to improve forage production, using heavy

equipment, and herbicide treatment of sagebrush. Rangeland restoration activities might also include aerial seeding, seeding by disking or drilling (using a tractor or other heavy equipment), fertilizing, or plowing.

Fencing. In some cases cross-fencing (subdividing an allotment, pasture, or ranch with fence) is used to accomplish management needs or when a parcel is leased by more than one lessee. Temporary fencing, including electric fencing may be authorized to accomplish management goals. Fencing might be used to reduce grazing intensity or distribute grazing livestock away from important resources (streams, springs, riparian areas, wetlands, cottonwood galleries, etc.). When fencing is proposed, either permanent or temporary, fences are built to standards described in the Bureau's Fencing Handbook. These fencing standards are required to reduce the amount of restriction or hazards to wildlife. Fence construction and maintenance would likely require access to the site, possible removal of vegetation or uneven surface materials (rocks, trees, sand, etc.), stringing wire, digging postholes, building fence braces, building rock jacks, cutting or removing on or off site building materials (fence posts, rails, gathering rocks, etc.), weed management (spraying, cutting, pulling, etc.), or if the project is large enough, the possibility of camps for workers. The use of corrals for confinement of livestock for various purposes (sheep shearing, overnight holding of livestock, etc.) requires construction and maintenance activities including, hauling building materials, heavy equipment use, access to the corral site, etc. Fencing activities include fence construction and repair, design and implementation of grazing systems, and building livestock exclosures for important riparian habitat.

Predator/pest management. Predator/pest management includes controlling predators or pests of livestock operations. Activities may include Mormon cricket or grasshopper control using insecticides, or the control of prairie dogs or coyotes on allotments using various lethal and non-lethal means.

Water Management. Water management activities include the development of reservoirs, springs, pipelines, and wells, and providing access to these developments. Permittees may undertake water improvement projects such as stock water ponds, pits, or reservoirs; pipeline and trough systems; spring developments; storage tanks and troughs; wells; or temporary tanks and water hauling. These off-stream water improvements better distribute the use and intensity of use by livestock away from streams, rivers or wetlands and help protect important riparian areas and could require the use of hand tools, mechanical or heavy equipment, hauling/transporting of materials (gravel, dirt, tanks, etc.), and clearing of vegetation.

Detrimental Impacts Management. Managing detrimental impacts includes documenting, treating, and preventing resource damage. Potential detrimental impacts include the degradation of stream banks, the introduction of noxious weeds, increasing soil erosion, and a reduction in cottonwood tree recruitment. The Bureau has committed to meeting the range management standards in the *Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands* (Appendix B of BLM 2003b) while managing its lands for livestock grazing. In extreme situations such as extended drought, permits may be placed in a reduced use or non-use status until conditions improve. Bureau-administered surface lands in the resource areas are managed to achieve the four fundamentals of rangeland health outlined in grazing regulations (43 CFR 4180.1) which are (1) watersheds are functioning properly; (2) water, nutrients and energy are cycling properly; (3) water quality meets state standards; and (4) habitat for special status species is protected. Monitoring of riparian/wetland areas by interdisciplinary teams using the proper functioning condition (PFC) methodology is the method

used by the Bureau to determine whether a given watershed is functioning properly. This would entail the use of a team of interdisciplinary personnel (generally 2-5 personnel) to assess the condition of the riparian/wetland habitat within a given allotment.

Lease Management. Lease management activities include conducting monitoring studies, performing project work to enhance and improve riparian zones, designating stock trails, managing leases, developing management plans and agreements, and canceling, or changing livestock driveways. Activities under this program include converting to new types of livestock; authorizing livestock grazing, and adjusting season of use, distribution, kind, class, and number of livestock. Grazing allotments are grouped into one of three categories: M (maintain), C (custodial), and I (improve). Recommendations are provided in each category for the intensity of grazing management, including multiple-use resource management objectives, needs for range improvement and monitoring, and actions needed to improve and maintain rangeland condition and productivity.

Table 2. Livestock Grazing Patterns (see BLM 2004)

Pattern of Use	Description
Yearlong	When livestock are retained in a pasture throughout the plant growing season or the pasture or allotment is grazed in the same manner continuously throughout the year, each year.
Seasonal	Livestock are grazed in various seasons, i.e.; spring/summer/fall, spring/fall, winter, spring, summer, fall, or any combination, but not the entire year.
Rested	Stipulates that a pasture is not grazed at all in a given year, not even the mature forage is grazed. Usually the rested pasture is managed in conjunction with a rotational grazing system.
Rotational	Involves a multi-pasture system, where livestock are moved from one pasture to another on a scheduled basis. A sub-set of this system is to graze a pasture for short duration with a large number of livestock then rest the pasture (short-duration pattern, high intensity).
Deferred	Specifies that a pasture is not grazed until seed maturity is assured or a comparable growth stage has been reached and that grazing occurs after seed maturity.

An environmental assessment is prepared prior to issuing new grazing leases, surface disturbing activities, and range improvement projects. Allotments are monitored by Bureau range specialists and changes in use are developed if resource conditions warrant such a change. Specific permit issuances are subject to separate consultation under the Act.

Bureau-administered surface lands in the Bureau’s resource areas are managed to achieve the four fundamentals of rangeland health outlined in grazing regulations (43 CFR 4180.1) which are (1) watersheds are functioning properly; (2) water, nutrients and energy are cycling properly; (3) water quality meets state standards; and (4) habitat for special status species is protected. A complete discussion can be found in the Approved Resource Management Plan, Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public lands Administered by the Bureau of Land Management in the State of Wyoming (see Appendix 2 of BLM 2004). Monitoring of riparian/wetland areas by interdisciplinary teams using the proper functioning condition (PFC) methodology is how the Bureau determines whether a given watershed is functioning properly. This would entail the use of a team of interdisciplinary

personnel (generally 2-5 personnel) to assess the condition of the riparian/wetland habitat within a given allotment.

Geology and Minerals (including Geothermal).

Program Description. The Bureau's Minerals and Geology Program is divided into three categories. These categories are salable minerals, leasable minerals, and locatable minerals.

Salable Minerals. The mining of salable minerals is authorized under the Materials Act of 1947, as amended, and is a discretionary action of the Bureau. Salable minerals include sand, gravel, stone, sandstone, shale, limestone, dolomite, granite rock, pumice, cinders, clay, and petrified wood. Historical use of these materials was for building materials, road surfaces, and tools. Today, salable minerals are generally used for maintaining roads and activities associated with the oil and gas industry. The Bureau provides sand, gravel, and stone from federal mineral deposits as necessary to meet the need for federal, state, and local road construction and maintenance projects under this category.

Before issuing contracts or free use permits for salable minerals, the Bureau conducts appropriate environmental assessments. These include special studies or inventories of cultural values, threatened or endangered plant and wildlife species, or other resources. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resource found there and reclamation of the land following project completion. Site reclamation is required following any surface disturbing mining activity for salable minerals. Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes. Reclamation includes removing all surface debris, recontouring, reducing steep slopes, and planting vegetation. All reclamation proposals must conform to state agency requirements and must be approved by the Bureau.

Salable minerals are a resource over which the authorized officer has discretionary authority. All surface disturbing activities, including the mining of salables, are subject to no surface occupancy (NSO) restrictions to protect threatened or endangered species habitat. The Bureau has agreed to apply a COA on all APDs within the occupied habitat of the Ute ladies'-tresses orchid, prohibiting all surface-disturbing activities.

Sand and gravel may be removed from naturally occurring sites generally accessed by using relatively short, unpaved roads. Typically in these operations, the topsoil is removed from the site and stockpiled with earth moving equipment (e.g., bulldozers, front end loaders, or scrapers). The salable mineral material is then extracted from the ground with loaders or mechanized excavators or industrial shovels creating a pit. Then the material is processed (i.e., crushed, screened, washed, etc.) at the site and hauled away in dump trucks or wheeled semi-transporters. Some operations may require the establishment of a quarry with rock cutting machinery and rock handling equipment such as hoists or cranes. Generally, construction of roads to a standard capable of bearing heavy, wide loads is required. Occasionally, water pumping equipment is required at the pit or quarry to keep the operations from becoming flooded, and once in a while transmission lines are extended to the site to provide an electrical power source. It is common to have an office or operations shed located at the site.

Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes, and is a requirement following any surface disturbance. Reclamation includes removing all surface debris, trash, and wastes resulting from extraction operations,

recontouring the land surface with heavy machinery where necessary, reducing steep slopes of pits and quarries with heavy machinery such as bulldozers, scrapers, etc. where necessary, replacing topsoil with earth moving equipment, and reestablishing vegetation either by planting or seeding by hand or with farm implement equipment (tractors, discs, harrows, seeders, etc.). Reclamation of disturbed sites is usually done as the operation moves ahead to new deposits.

Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes, and is a requirement following any surface disturbing activity. Reclamation includes removing all surface debris, trash, and wastes resulting from mining operations, recontouring the land surface with heavy machinery where necessary, reducing steep slopes of pits with heavy machinery such as bulldozers, scrapers, etc. where necessary, replacing topsoil with earth moving equipment, and reestablishing vegetation either by planting or seeding by hand or with farm implement equipment (tractors, discs, harrows, seeders, etc.). Reclamation of disturbed sites is often done as the operation moves ahead to new deposits.

Leasable Minerals. Leasable minerals include solid minerals such as coal, uranium and bentonite from acquired lands, and fluid minerals such as oil and gas. Fluid leasable minerals include oil, gas, and coal bed methane development (CBM).

The Mineral Leasing Act of 1920 provides that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. The Wyoming Bureau has some of the most prolific oil-producing areas in the Rocky Mountains. Once acreage is nominated by the public to be included in an oil and gas lease sale, the acreage is sent to the appropriate Bureau resource area via the parcel list to be reviewed and stipulated for protection of wildlife and other sensitive resources. These stipulations become part of the lease. Exploration, development, and reclamation are common phases of most leases. Mineral exploration involves opening areas to geophysical (seismic) exploration; permitting the exploration; allowing oil, gas, and mineral development; and leasing and developing oil, gas, and geothermal steam resources. Seismic exploration involves the use of shock waves to describe the mineral structure of the Earth's subsurface. This technology is used to locate reserves of oil and gas resources. Before seismic activity is completed, a Notice of Intent which gives the location and type of activity, and the results of an on-the-ground cultural inventory must be filed. The Bureau conducts an in-office study as well as environmental analysis to determine if any threatened or endangered species will be affected.

Prior to oil and gas drilling activities, an application for permit to drill (APD) must be approved and a site-specific Environmental Assessment (EA) completed for each APD. Drilling operations are inspected regularly as are production facilities. All surface disturbing activities are subject to no surface occupancy (NSO) restrictions to protect threatened or endangered species habitat. The Bureau has agreed to apply a COA on all APDs within any identified Ute ladies'-tresses occupied habitat, prohibiting all surface disturbing activities.

Ancillary development for oil and gas activities involves the construction of roads, pads, and other facilities; and the construction of new above ground powerlines. Stipulations involve implementing leases with no surface occupancy restrictions, seasonal restrictions, or with other standard surface protection restrictions; negotiating mitigated impacts between lessees and authorized officer; deciding mitigation measures and limitations, and reclamation. Reclamation

involves correcting any disturbance made by the oil and gas operation. Reclamation activities take place following the expiration of the lease. Reseeding, reshaping or road destruction are all activities involved with oil and gas reclamation.

Federal oil and gas program activities can be functionally divided into five categories: leasing, exploration (seismic and drilling), development, production (primary, secondary, and tertiary), and closeout/abandonment. Once acreage is nominated by the public to be included in an oil and gas lease sale, the acreage is reviewed and stipulated by the Wyoming State Office for protection of wildlife and other sensitive resources, then notice these lease stipulations are sent to the Bureau's resource areas for review. If these stipulations are appropriate, they ultimately become part of the issued lease.

Prior to conducting geophysical exploration activity, an NOI which describes the location and type of project, the results of an on-the-ground cultural inventory must be filed by the appropriate Bureau resource area. The Bureau conducts an in-office study as well as environmental analysis, which includes an initial determination as to whether any threatened or endangered species is conducted. If necessary, a field exam or survey for threatened or endangered species is conducted. Seismic activity can involve surveys with vibroseis and shot holes. Traditional geophysical exploration operations involve the stringing of vibration sensitive cable geophones in a line across the landscape for a distance of from one to several miles. The geophones are connected to an instrument truck or trailer equipped to gather and record seismic data. A geologic vibration source (e.g., subsurface explosions, ground surface explosions, heavy "thumper" trucks, etc.) is then activated, and the reflected vibrations from the Earth's geologic structure are then recorded from the geophone lines. Any surface equipment/instruments and left over trash is then collected, and any surface disturbance (e.g., shot holes) is then reclaimed. Occasionally, geophysical data is collected aerially using instruments capable of measuring the Earth's magnetic characteristics.

Prior to conducting site-specific drilling activities, a site specific EA is completed for each APD, or group of APDs. APDs are subject to site-specific conditions of approval which may be more restrictive than lease stipulations. Based on environmental reviews, further timing and location restrictions may be added to protect local resources. Once an APD is approved, ground operations may begin. In traditional oil and gas operations, a minimum road capable of handling a well drill rig is constructed to the site, and a level 'pad' ranging in size from one to five acres is constructed for drill rig and ancillary facility (e.g., pipe racks, production pits, parking areas, etc.) setup. A drillhole is started (i.e., spudded) and drilling continues until the targeted geologic formation is reached. If a well is not capable of producing economic quantities of oil or gas, it is shut in and plugged and marked and the surface is reclaimed to its previous condition. If a well is a producing well, production facilities (e.g., pipelines and/or storage tanks, water treaters, pipeline compressor stations, powerlines, pumpjacks, fencing, etc.) will be constructed, and road upgrades may occur to accommodate tank trucks used to haul the oil to a terminal or local refinery. Discovery of a producing area may result in additional wells being drilled and a pipeline system established to transport the oil to a storage facility or terminal. If extensive reserves of oil are located field development may occur which would result in additional wells and transport systems with well spacing determined by the Wyoming Oil and Gas Commission. Drilling and production operations and facilities are inspected and maintained regularly, and varying amounts of human and vehicle activity is present with all the above actions.

When oil and gas wells are no longer capable of producing economic quantities of product, the field is closed out and abandoned. At each well location, all the "down-hole" and surface facilities are removed and the drillhole is plugged. The pad and production pits are reclaimed to existing standards, and a hole marker is placed at the well site. Unnecessary access roads are reclaimed (i.e., recontoured and revegetated). Various types of heavy equipment and vehicles are used for these activities. Finally, the site is inspected, bonds are released as appropriate, and the site is declared closed.

Locatable Minerals. Bentonite, uranium, and gypsum are the principle locatable minerals of Wyoming Bureau Resource Management Areas. Other locatable metallic minerals include silver, gold, platinum, cobalt, and other precious minerals. Actions associated with commercial locatable minerals include surface disturbance for mining, reclamation, and construction of access roads, buildings, and utility lines. Small scale mining may occur in the Bureau areas in Wyoming. All lands must be reclaimed after expiration of a mining lease.

Locatable minerals are those valuable mineral deposits which are not included under the authority of the mineral leasing acts, and do not include the common variety salable minerals such as sand, gravel, stone, cinders, pumice, clay, etc. Mining claims, either placer (surface or near surface alluvial or layered deposits), or lode (deeper underground layers, or veins), are staked (i.e., "located") for locatable minerals. All public lands are open to exploration for locatable minerals, except those withdrawn to protect other resource values and uses, or those lands with acquired federal mineral status. The Bureau has only limited management authority (i.e., discretion) over mining claim operations. Activities dealing with locatable mineral extraction are generally not subject to many of the special stipulations that are used in the salable and leasable mineral programs to protect sensitive resources from surface disturbance caused by mineral development.

Locatable mineral exploration and mining activities on Bureau-administered land are subject to the surface management regulations of the Secretary of the Interior in 43 CFR 3809, and for Wilderness Study Areas in 43 CFR 3802. These regulations require an operator to prevent unnecessary or undue degradation of the land. For activities other than casual use, they require the operator to submit either a notice, or a plan of operations and accompanying reclamation plan. Five acres or less of surface disturbance from exploration activities requires a notice to be filed with the Bureau. The notice must describe the proposed activities, the location on the ground, the start-up date, road access and construction, if any, and reclamation measures. Receipt and review of a notice is not a federal action and approval by Bureau is not required.

A plan of operation must be submitted for exploration greater than five acres, or the production of minerals from any size of disturbance. If a plan of operations is required, it must include a description of the proposed activities, road access and construction, reclamation measures, time frames of non-operation, and a sketch or a map of the area to be disturbed, including all access routes. An EA or an EIS must be prepared by the Bureau or the claimant/operator prior to commencement of any surface-disturbing activities. A plan of operations must be approved by the Bureau, and operations at the plan level may not commence until the plan is approved. Operators must take such action as needed to minimize or prevent adverse impacts to plants, fish, and wildlife, including threatened and endangered species and their habitat.

Actions associated with locatable minerals mining activities are as varied as the types of mining operations themselves. Typically, initial access roads are constructed to the mine site, and

exploratory drilling with vehicle mounted machinery will take place, or exploratory pits will be excavated to define the resource boundaries. Most bentonite and uranium is recovered by open pit surface mining operations. Large earth-moving equipment may remove the topsoil and possibly some overburden materials, and place them aside during the actual mining operations. The mineral resource is then removed from the pit with heavy earth moving equipment such as scrapers, loaders, and industrial shovels, and hauled by mine roads to processing and/or load-out facilities, usually at or near the mine site. Various buildings are constructed at the mine site as well as permanent access roads and utility lines. Sometimes railroad lines are built to the mine site to transport the product to market. Following mineral recovery, the mine site is reclaimed and sold or transferred to other uses and purposes. Hardrock minerals are often recovered underground by shaft mining methods. The mining manifestations at the surface may be the presence of access roads or railroads, powerlines, administrative and equipment buildings, rock crushers and mineral processing facilities, and tailings piles at or near the mine. There may also be some mine water production pits and facilities present. Placer operations typically use large shovels or dredges to turn over in-stream and streamside alluvium for sluicing and screening to separate the gravels from the mineral materials. Some placer operations may use high-pressure hydraulic "cannons" to slurry the surface soils and materials into rock crushers, sluicing, and screening equipment for mineral separation.

Reclamation is a requirement following any surface-disturbing activity, even if the claim or site is declared abandoned and void by the Bureau. It is also required if the claimant relinquishes the claim or site to the federal government. The Bureau requires a reclamation bond or other financial security prior to the start of surface disturbing operations. The Bureau expects the operators to reclaim the lands affected under their notice or approved plan of operations according to the measures stipulated by the authorized officer. All work must be reclaimed prior to bond release from the Wyoming Department of Environmental Quality.

STATUS OF THE SPECIES

Species Description

Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial, terrestrial orchid with stems 20 to 50 centimeters (cm) tall arising from tuberously thickened roots measuring up to 1 cm in diameter. It has narrow leaves about 28 cm long and 1.5 cm wide at the base of the stem and becomes reduced in size going up the stem. The flowers, in an inflorescence (flowering spike) of 3 to 30 or more flowers, are small white to ivory arranged in a spiral. The species is characterized by stout flowers that are gaping at the mouth. The sepals and petals, except for the lip, are straight, although the lateral sepals are variably oriented. These lateral sepals spread abruptly from the base of the flower and are free to the base. The rachis is densely pubescent with the longest trichomes, or hairs, 0.2 millimeters long or longer (Sipes and Tepedino 1994, USFWS 1992, 1995).

Life History

Very little is known about the life history of Ute ladies'-tresses (USFWS 1995). Much of what is presumed about the species' life history is drawn from knowledge of other orchids. Orchids generally have very small seeds that require symbiotic associations with mycorrhizal fungi for germination. Many species of orchids are saprophytic, underground plants that may persist for

many years underground before emerging above ground. The mycorrhizal stage is reported to last 8 years in *S. spiralis* and green leaves are first produced up to 11 years after germination in that species (Wells 1967). Studies of *S. magnicamporum* in western Kansas and Nebraska report that that species may bloom as rarely as once in 20 years. The mean life expectancy of *S. spiralis* plants studied over a nine year period was calculated to be more than 50 years (USFWS 1995).

Throughout its range, reproduction of the Ute ladies'-tresses orchid appears to be strictly sexual, with bumblebees (*Bombus* spp.) as the primary pollinators (Arditti 1992, Sheviak 1984). Flowers are protandrus (functionally male first and then female). As with other orchid species, it is thought that Ute ladies'-tresses does not reach sexual maturity for 5 to 10 years (USFWS 1995). Each orchid fruit can have several hundred to 10,000 seeds with an average of around 2,000 (Sipes and Tepedino 1994). These seeds may be dispersed by water (Carroll 2004) or wind (Wells 1967). The flowers, seed heads, and vegetative parts of the Ute ladies'-tresses orchid are palatable and can be incidentally eaten by grazing livestock. The possibility that grazers could disperse the seeds of this species has not been evaluated. The blooming period is from early August to early September, with fruits produced in mid-August to September (Fertig 2000). Not all individual mature Ute ladies'-tresses orchids bloom every year and some may remain dormant beneath the ground surface and not show any above ground parts for at least one growing season (Arft 1995).

Populations of Ute ladies'-tresses may do well under a regime of somewhat heavy use, i.e., livestock grazing and hay mowing. Grazing may have beneficial effects to the plants, especially in early summer prior to flowering or fruit production (Arft 1995, Moseley 1998). Grazing may mimic the effects of flooding, fire, or other disturbances in maintaining low vegetative cover or reducing weed cover (Moseley 1998). Mowing may be beneficial by reducing competing vegetation cover, but can be detrimental if done before fruit ripen or if hay is cut too low (Arft 1995; Hazlett 1996, 1997). Ute ladies'-tresses does not tolerate dense competition of vegetation, although a few populations are found in riparian woodlands.

The Ute ladies'-tresses orchid inhabits early successional riparian habitats such as moist stream beds, wet meadows, point bars, sand bars, abandoned stream channels, and low lying gravelly, sandy, or cobbly edges (Fertig et al. 1994, USFWS 1995, Fertig 2000). Ute ladies'-tresses appears to have a close affinity with floodplain areas where the water table is near the surface throughout the growing season and into early autumn. The species is found in open riparian, floodplain areas where the competing vegetation has been removed by livestock grazing, mowing or by flooding events approximately one month prior to flowering. Ute ladies'-tresses is known to grow in agricultural lands managed for grazing in the winter and hay production in spring and summer, where mowing occurs in mid-July (USFWS 1995). The elevational range of known Ute ladies'-tresses occurrences is 1800-6800 feet (Arft and Ranker 1998), while the known Wyoming populations range from 4650-5420 feet (Fertig 2000).

Population Dynamics

Ute ladies'-tresses population levels and viability are, at least in part, determined by habitat conditions created and maintained by natural water processes. Therefore, the significance of population size and distribution within a watershed can, at least partially, be assessed in terms of

the ability of the watershed factors to perpetuate it. However, the linkages between watershed processes, habitat conditions, and Ute ladies'-tresses population response are complex and not completely understood.

The locations of populations within a watershed vary with the availability of suitable habitat. Sizes of populations fluctuate naturally. Some years not a single Ute ladies'-tresses individual appears above ground. The number of flowering adults does not give an accurate picture of population size nor tell us anything about population structure. More information is necessary regarding population viability (USFWS 1995).

If estimated population size is based on the number of Ute ladies'-tresses flowering spikes, then populations appear to fluctuate dramatically in size from year to year (USFWS 1992). For example, the primary site for the Boulder, Colorado population contained 5,435 plants in 1986, 200 plants in 1987, 131 plants in 1988, 1,137 plants in 1989, 1,894 plants in 1990, and at least 80 plants in 1991 (USFWS 1992). This variability in apparent population size is consistent with other observations made of other orchid species.

However, Wells (1967) questions that apparent fluctuations in orchid numbers are accurate descriptions of the actual dynamics of the orchid populations. According to Wells (1967), the criterion adopted for judging whether the number of orchids at a site has changed or not has been the number of flowering spikes displayed at the time of visit. This may be an unsatisfactory criterion for measuring a quantitative change in population because, as has been demonstrated, plants may spend several years as vegetative rosettes or as underground tubers (as many as 11 years) with no above-ground parts. Furthermore, according to Wells (1967), the autumn ladies'-tresses orchid (*S. spiralis*) grows mainly in short grassland which is typically maintained in that condition by some kind of grazing which can damage some of the flowering spikes making a visual estimate of number based on count of flowering spikes unreliable. Arft's (1995) work on Ute ladies'-tresses supports this theory as well.

At the time of listing of Ute ladies'-tresses, most of the species' historic western populations on the Wasatch Front and in the Great Basin were believed to have been extirpated by urbanization. Most known populations contained fewer than 1,000 plants when counted in 1990 and 1991. Eastern Utah populations were also typically small in size. Local extirpations may have taken place in currently unoccupied potential habitat similar to extirpations which occurred along the Wasatch Front, the Great Basin, and certain historic populations in Colorado (USFWS 1992).

In 1992, when the species was listed, the total known population size of Ute ladies'-tresses was fewer than 6,000 individuals from 11 known populations in Colorado, Utah, and Nevada (USFWS 1992). The January 17, 1992, listing of Ute ladies'-tresses resulted in an increase in surveys for the species. Since that time, additional populations have been located in Utah, Montana, Idaho, Nevada, Colorado, Nebraska, Washington, and Wyoming. In 1995, the total known population size of Ute ladies'-tresses was approximately 20,500 individuals (USFWS 1995). Additional Ute ladies'-tresses populations have been discovered since that 1995 population estimate.

Status and Distribution

On January 17, 1992, the Service listed Ute ladies'-tresses as threatened in its entire range under the Act (57 FR 2053). The Ute ladies'-tresses was first described as a species in 1984 by Dr.

Charles J. Sheviak from a population discovered near Golden, Colorado (Sheviak 1984). At the time of its listing, Ute ladies'-tresses was known from 11 populations occurring in Colorado, Utah, and Nevada. Critical habitat has not been designated at this time. To date, no recovery plan has been approved for this species. However, a draft recovery plan has been written (USFWS 1995). On October 12, 2004, the Service issued a 90-day finding on a petition to delist the Ute ladies'-tresses orchid and initiation of a 5-year review. The petition stated that (1) there is substantial new information indicating that the population size and distribution are much larger than known at the time of listing, (2) there is more information on life history and habitat needs, allowing better management, and (3) threats are not as great in magnitude or imminence as understood at the time of listing (USFWS 2004b).

Ute ladies'-tresses was first discovered in Wyoming by the University of Wyoming, Rocky Mountain Herbarium in 1993. Formal surveys for Ute ladies'-tresses then began in Wyoming in 1994, one year after B. Ernie Nelson, manager of the Rocky Mountain Herbarium, discovered the State's first population in Goshen County. Nelson, staff from the Rocky Mountain Herbarium, and graduate students conducted general floristic surveys in southeast Wyoming, the Green River Basin, and Laramie Basin from 1994-1999, finding an additional new colony along Antelope Creek in Converse County in 1994 (Hartman and Nelson 1994). Currently there are three populations in the Antelope Creek drainage occurring on Bureau-administered land in the Platte River Resource Area. Presently, eight populations of Ute ladies'-tresses are known to occur in Wyoming.

Hartman and Nelson (1994) found that populations discovered in Wyoming occurred on terraces, low slopes, and oxbows adjacent to small streams on sandy to coarse gravelly alluvium or alkaline clays in wet meadow communities (Nelson and Hartman 1995). Based on short-term observation data, the populations that they found were thought to be stable or increasing. The sites were on lands managed for livestock grazing or hay production. Current land uses at the time appeared compatible with the habitat needs of Ute ladies'-tresses orchid populations. The timing of grazing and mowing was thought to be critical for successful seed production (Fertig 2000).

Through coordination with and cooperation from a private landowner, Don Hazlett was granted permission in 1996 to search an area along the Niobrara River in Sioux County, Nebraska. Hazlett (1996) counted several thousand Ute ladies'-tresses (Hazlett 1996). The area was previously mown in July of that year for hay and thousands of Ute ladies'-tresses were flowering in the pasture apparently flourishing from the reduced competition following the mowing and baling. The discovery was the first reported case of *S. diluvialis* in the State of Nebraska. Future plans for that area are to maintain it as a working ranch or as a youth camp/nature preserve for young people (Hazlett 1996).

Walter Fertig and George Jones of the Wyoming Natural Diversity Database (WYNDD) surveyed public lands in Jackson Hole and the lower Green River Basin in 1999, but did not find any new *S. diluvialis* sites. Staff of the WYNDD also conducted unsuccessful searches in the Powder River Basin, National Elk Refuge, and F.E. Warren Air Force Base from 1995-1997.

Various environmental consulting firms (e.g. ERO Resources 1994) have searched for *S. diluvialis* across the State since 1994. These efforts have not documented any new colonies (Fertig 2000). Because of the plant's irregular flowering pattern, sites which have been surveyed in the past could still harbor populations (Fertig 2000). Fertig (2000) recommends that high-

quality sites of potentially suitable Ute ladies'-tresses habitat be resurveyed periodically because the species may not have been flowering or emergent during previous survey efforts.

Since their discovery in Wyoming, Ute ladies'-tresses populations have been located in Goshen, Converse, Laramie, and Niobrara counties of southeastern Wyoming. Surveys have yet to be conducted on all potential existing orchid habitat on Bureau-administered lands within the Bureau's Wyoming resource areas. The variability of Ute ladies'-tresses emerging and flowering every year, makes it difficult to effectively locate populations and inventory them. Future surveys in these resource area may find populations of Ute ladies'-tresses on Bureau-administered surface and/or split-estate lands on potential habitat that is within 50 feet of streams, rivers, and riparian areas with sandy or loamy clay soils (BLM 2005).

Threats

Urban, residential, agricultural, or recreational development within riparian or lacustrine floodplain areas could threaten Ute ladies'-tresses populations. These activities historically have likely been a primary cause of the fragmentation of populations now currently observed. There is increasing pressure for urban, residential, and recreational development in these wetland and riparian areas, especially along the Front Range of Colorado and the Wasatch Front in Utah. As these areas are typically in private ownership, and the projects are often privately funded, there is very little regulatory protection for the orchid, even though it is a federally-listed species.

Incompatible agricultural or other land management practices could also threaten the Ute ladies'-tresses orchid. The orchid is quite tolerant of grazing and other forms of land and vegetation disturbance. However, continuous grazing during the flowering season, severe trampling and soil compaction, untimely herbicide applications, proliferation of aggressive native and exotic plant species indicative of site degradation, and practices that result in habitat alteration from grass/forb/sedge to shrub/tree dominance, can result in loss of vigor and eventual demise of the orchid and/or orchid pollinators. Many riparian and other wetland and wetland/upland habitats suffer from these impacts.

Alterations of stream hydrology could also threaten Ute ladies'-tresses. The orchid is supported by moist soil throughout the growing season, and by wet habitats that are dominated by grass/forb/sedge communities. During the past 150 years, and continuing today, water development, diversions, stream channel alterations for flood control or other purposes (including oil and gas development and mining), and changes in hydrograph have altered hydrology, floodplain geomorphology, and vegetation composition and trends. While in some streams and reaches this may have provided improved conditions for the orchid, in many cases it has resulted in the loss of suitable habitat and likely fragmentation or loss of the orchid within watersheds (USFWS 2004a).

Invasive plant species occupy many areas of the Bureau's resource areas. Herbicide are applied by private citizens or performed by County Weed and Pest Districts to control these invasive species. Presently, no invasive plant species are known to be adversely impacting any Ute ladies'-tresses plants within Wyoming. However, leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), and Russian knapweed (*Acroptilon repens*) are a few species which are present in eastern Wyoming and may pose a threat to Ute ladies'-tresses populations in the future. Also, robust grasses such as tall fescue (*Festuca arundinacea*) and reed canarygrass (*Phalaris arundinacea*), if introduced into the wet meadow habitat of Ute ladies'-tresses orchids

could form a 100 percent canopy overshadowing and competing with Ute ladies'-plants present there. Native grass such as prairie cordgrass (*Spartina pectinata*) could also potentially displace Ute ladies'-tresses orchids. Nitrogen-fixing plants such as alfalfa (*Medicago sativa*), and sweetclovers (*Melilotus* spp.) could increase the fertility of the soil at Ute ladies'-tresses sites giving robust grass species a competitive edge over the orchids (B. Heidel, personal communication).

ENVIRONMENTAL BASELINE

Regulations for implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed state or federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process.

The action area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action". For the purposes of this consultation, the Service defines the action area to include all suitable habitat for Ute ladies'-tresses located on Bureau-administered public land surface or lands overlying Bureau-administered subsurface in the Bureau's resource areas across Wyoming. This action area includes all floodplain areas in the Wyoming Bureau's resource areas, where the water table is near the surface throughout the Ute ladies'-tresses growing season, that could potentially be impacted by decisions made in the Wyoming Bureau RMPs (BLM 2000).

The past and present impacts to Ute ladies'-tresses in the action area may have included increases or decreases in habitat suitability due to irrigation developments and other human-caused changes to stream hydrology or changes to water quality. Human-caused changes to stream hydrology have taken the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water depletions from surface waters. These activities are widespread across the Wyoming resource areas and many historical projects exist that have changed stream hydrology. Water quality changes may have occurred from discharge of water high in salts, or other deleterious chemicals.

Ute ladies'-tresses is currently known from eight sites in eastern Wyoming. The location of these is shown in Table 3. Ute ladies'-tresses populations are monitored on a limited basis and appear to be stable. Mowing and grazing occur at some of the sites and appear to have only minor impacts on the populations.

Table 3. Known Ute ladies'-tresses locations in eastern Wyoming.

Location	County	Land Ownership
A tributary to Antelope Creek	Converse	BLM
North Wind Creek (Antelope Creek drainage)	Converse	BLM
Stinking Creek (Antelope Creek drainage)	Converse	BLM
Bear Creek	Goshen	State Trust Lands
Bear Creek	Laramie	State Trust Lands
Sprager Creek	Laramie	Private
Horse Creek drainage	Laramie	Private
Near McMaster's Reservoir	Niobrara	Private

The Ute ladies'-tresses populations located within the Antelope Creek drainage in Converse County are the only populations presently known to occur on Bureau-administered land or on lands overlying Bureau-administered subsurface. Ute ladies'-tresses were originally discovered within the Antelope Creek drainage in 1994 and have been censused several times since their discovery and determined to have low but stable numbers in that drainage (Fertig 2000).

Livestock grazing has widespread occurrence within the Wyoming resource areas. Grazing activities on Bureau-administered lands are authorized by the Bureau through a permitting process. Grazing, haying, and mowing activities are part of the agricultural operations on private lands. These activities may positively benefit Ute ladies'-tresses by reducing competing vegetation; however, if not timed properly, they can reduce the reproductive success of individual Ute ladies'-tresses plants.

Another impact to Ute ladies'-tresses plants in the action area may be herbivory by wildlife. Herbivory of the flowering spikes of Ute ladies'-tresses orchids by voles (Arft 1994), deer (Fertig 2000), and moose (Moseley 1998) does occur at some locations. Wells (1967) documented significant flowering stalk herbivory of the autumn ladies'-tresses orchid by rabbits. Arft (1994) speculated that vole herbivory could be the greatest single threat to the long-term survival of Ute ladies'-tresses at one study site. It is plausible that similar damage to Ute ladies'-tresses plants in the action area could be attributed to wildlife as well.

Coal mining and coal bed methane development are significant land use activities in the Bureau's Buffalo Resource Area and may become more prevalent in the northern portions of the Bureau's Platte River Resource Area. Coal bed methane development may adversely affect Ute ladies'-tresses if this activity occurs adjacent to, upstream, or downstream from populations. It is possible that the water produced by approximately 25,000 existing coal bed methane wells may have significantly altered the hydrology (USFWS 2003a, 2007). Hydrological changes could in turn affect Ute ladies'-tresses occupying those same areas. In 2001, approximately 6,400 coal bed methane wells produced 182 acre-feet per day (Likwartz 2002). The produced water was discharged into surface waters (streams, ephemeral draws, impoundments) or into closed basin containment impoundments for disposal.

Six formal section 7 consultations have been completed which analyzed potential adverse effects to Ute ladies'-tresses orchids in Wyoming. One of these consultations analyzed potential adverse effects for livestock grazing in the Bureau's Newcastle Resource Area (ES-6-WY-04-F025; October 5, 2004). Three of these analyzed potential adverse effects associated with coalbed methane development in the Powder River Basin (WY4287, March 9, 2001; ES-6-WY-

02-F006, December 2002; WY07F0012, March 23, 2007) of Wyoming. The remaining two formal section 7 consultations analyzed surface disturbance in Ute ladies'-tresses habitat associated with pipeline construction (WY2567, July 16, 1999) and railroad expansion (ES-6-WY-01-F008, October 26, 2001), respectively.

Status of the Ute Ladies'-tresses Within the Action Area

Only three Ute ladies'-tresses populations are known to occur on Bureau-administered lands in the Bureau's Wyoming resource areas. These populations are located along three separate tributaries of Antelope Creek in northwestern Converse County. The location of other known populations in eastern Wyoming makes its potential for occurrence in other locations on other Bureau-administered lands likely. The Bureau supports efforts to locate the orchid on Bureau-administered or nearby state or private lands (see Hazlett 1995, 1997, 1999). Surveys have been conducted in what have appeared to be suitable habitat in other portions of the action area but no Ute ladies'-tresses have been found at those surveyed locations. Future surveys may reveal that more populations do exist on Bureau-administered surface lands in Wyoming.

Within the Bureau's resource areas, potentially suitable habitat exists along creeks, streams, and riparian areas that may support Ute ladies'-tresses. Locations where populations of Ute ladies'-tresses may be discovered in the Wyoming Bureau resource areas include but are not limited to moist meadows within 50 feet of rivers and creeks throughout Wyoming.

Don Hazlett, a botanical consultant under contract to the Bureau, also surveyed public and private lands in southeast Wyoming and Nebraska and discovered new populations in Niobrara and Laramie counties (Hazlett 1995, 1997, 1999). These populations were located on private land over which the Bureau has no discretionary authority. From 2 to 40 individual plants were seen at 5 separate locations. Riparian areas on these private lands near the Niobrara River had been grazed. Hazlett (1996) stated that grazing and climate, such as high rainfall during 1995, may have contributed to the survival and success of these orchid populations.

Factors Affecting the Ute Ladies'-tresses Within the Action Area

Factors that could affect this orchid in the action area include irrigation developments and other human-caused changes to stream hydrology or water quality, sedimentation, erosion, introduction of invasive species, herbicide use, haying, mowing, and livestock grazing (USFWS 1995). Human-caused changes to stream hydrology may take the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water depletions from surface waters. These activities are widespread across the Wyoming Bureau resource areas. Many historic projects exist that have changed stream hydrology or water quality or have caused increases in erosion and/or sedimentation rates. Invasive plant species occupy much of the Bureau's resource areas and herbicide use to control these invasive species are undertaken by private citizens or performed by County Weed and Pest Districts. In addition to private and county and private weed and pest actions, each group of coal bed methane wells has a Bureau-approved pesticide use proposal addressing proposed methods for controlling noxious/invasive weeds on areas where coal bed methane development is occurring.

Depending on the time of year when it occurs, grazing may be either detrimental or beneficial to Ute ladies'-tresses populations. If grazing occurs during the flowering stage, grazing may

reduce the plant's reproductive capacity through removal of the inflorescences (flowering spikes) of individual Ute ladies'-tresses plants. However, if timed to occur prior to or subsequent to the plant's flowering stage, grazing may also be beneficial by reducing the density of competing vegetation thereby helping to maintain the plant's habitat.

Coal mining has been a major influence in the Bureau's Buffalo Resource Area and may have adversely affected Ute ladies'-tresses habitat in some areas in the past. Coal bed methane development may affect Ute ladies'-tresses populations adjacent to or downstream from areas of coal bed methane development. The huge volumes of water discharged from a large number of coal bed wells may have altered hydrology or water quality, or increased sedimentation rates to the extent that Ute ladies'-tresses are adversely affected in these areas. Few surveys for Ute ladies'-tresses have been completed downstream from areas impacted by coal bed methane wells.

EFFECTS OF THE ACTION

The Bureau's Statewide Programmatic Ute ladies'-tresses orchid BA describes activities in the Livestock Grazing program that may affect and are likely to adversely affect the Ute ladies'-tresses orchid across Wyoming. Also, activities permitted by the Bureau's Minerals and Geology Program may adversely affect Ute ladies'-tresses orchids in the Bureau's Buffalo and Platte River Resource Areas. The effects associated with these programs are (1) the trampling or destruction of the inflorescences (flowering spikes) of individual Ute ladies'-tresses plants by livestock grazing, (2) any manipulation of the timing or intensity or cessation of grazing of the habitat of this plant, and (3) effects to the water quality, hydrology, or sedimentation or erosion rates of Ute ladies'-tresses habitat due to coalbed methane development.

Direct and Indirect Effects

Direct effects are effects that result directly or immediately from the proposed action on the species. For example, actions that would immediately remove or destroy habitat or displace the species from its habitat would be considered direct effects. Indirect effects are effects that are caused by, or result from, the proposed action and occur later in time after the proposed action is completed, e.g., grazing over the life of the RMP (10-15 years) may maintain or could adversely affect habitat for Ute ladies'-tresses plants that may occupy the area 15 years from present. Potential effects could result from direct damage to individual Ute Ladies'-tresses plants from grazing or trampling of the flowering parts of the plant. Loss of habitat could also occur if the Bureau did not permit livestock grazing activities and Ute ladies'-tresses habitat was not maintained in suitable condition.

Trampling or grazing of Ute ladies'-tresses flowering spikes may occur as livestock move along trails while grazing or moving to water. Conversely, ceasing or over-limiting use of any occupied Ute ladies'-tresses habitat by livestock use or grazing could result in loss of Ute ladies'-tresses habitat since it appears Ute ladies'-tresses requires some maintenance of its habitat by removal of overstory vegetation.

Hydrologic changes to Ute ladies'-tresses habitat may render that habitat uninhabitable by flooding or complete inundation of the habitat or by drying of the stream on which the plants depend for moisture. Similarly, a change in chemical composition, for example the sodium

absorption ratio, of the soil inhabited by Ute ladies'-tresses could increase the salt content of the soil making the soil uninhabitable by Ute ladies'-tresses as well as other native plant species. Coal bed methane produced water often contains high concentrations of dissolved salts, making it toxic to plants. Soil saturated with high salinity water will have the soil structure destroyed and water uptake by plants will be inhibited leading to plant stress or death. Bartos and Ogle (2002) characterized groundwater samples from coal bed aquifers in the Powder River Basin of northeastern Wyoming in the medium to very high salinity hazard classes. Water in the high or very high salinity hazard class is not suitable for application on soil.

An elevated sodium absorption ratio causes soil dispersion and swelling of clay particles. Large sodium ions separate clay particles causing them to expand, thus causing swelling and soil dispersion. The soil dispersion causes clay particles to plug soil pores, resulting in reduced soil permeability. The repeated process of wetting and drying combined with clay dispersion will cause the clay soil to reform and solidify and become cement-like. Reduced infiltration, reduced hydraulic conductivity, and surface crusting will also occur and adversely affect vegetation (Pearson 2006).

The proposed action is the management of the Bureau's Wyoming resource areas for up to 15 years. Since (1) there is such a lengthy time period for the life of the proposed action and direct effects could occur under the proposed action for up to 15 years, and (2) the indirect effects resulting from the proposed action may be combined with direct effects or be sufficiently difficult to distinguish from direct effects, the two types of effects are not differentiated here but instead are discussed jointly in the following discussion.

Analysis for Effects of the Action

Livestock Grazing. Habitat alterations resulting from agricultural use (grazing) may be beneficial, neutral, and/or detrimental to Ute ladies'-tresses orchids depending on when they occur (McClaren and Sundt 1992, USFWS 1995). The Ute ladies'-tresses orchid is edible to livestock and depressed inflorescence (flowering spike) and fruit production have been observed at sites that are grazed in late summer (Arft 1995). However, at least two populations in Idaho and Colorado have been grazed for over 50 years but still support large populations of Ute ladies'-tresses (Arft 1995). This indicates that the population is capable of reproduction in the presence of long-term grazing. However, populations may experience short-term impacts associated with grazing.

Grazing is the primary land use found at Ute ladies'-tresses populations in Wyoming (Fertig 2000). Livestock grazing activities have variable effects on Ute ladies'-tresses. Grazing livestock could reduce competition with other grasses and forbs thereby allowing Ute ladies'-tresses to take advantage of sunlight, water, and nutrients that might otherwise be deprived of the plant.

In a 4-year study of a separate species of ladies'-tresses orchid (*S. spiralis*) in Great Britain, Wells (1967) discussed damage done by herbivores to that species (autumn ladies'-tresses). Wells (1967) found that herbivores did very little damage to the leaves of that species even under years of heavy grazing by sheep. Damage to the leaves was observed only twice during that 4-year study, in which 1,639 autumn ladies'-tresses plants were examined. On two occasions, only one leaf of a rosette was affected, the damage taking the form of a translucent browning of the leaf lamina. There was no evidence of physical damage from grazing and the cause of the

browning remained unknown. Wells (1967) speculated that this unusually small amount of damage to the basal rosette leaves indicated how well-adapted that ladies'-tresses orchid is to an open habitat in which the turf is kept short by grazing animals.

In contrast, according to Wells (1967) damage to the flowering spike of some autumn ladies'-tresses orchids was observed in every year of his 4-year study and took several forms. Damage thought to be caused by sheep grazing was characterized by the upper part of the flowering spike missing and the jagged end of the spike remaining. A second type of damage to the flowering spike reported was trampling by cattle. Trampling damage caused by cattle was noticed during the final year of the study after cattle had grazed the study area during the orchid's flowering period. On those plants affected by trampling, flowering spikes were broken near the base of the plant, but Wells (1967) found that in most of the plants affected the spikes were not completely severed from the plant.

According to Wells (1967), the number of plants with damage to the flowering spike varied in each year according to the type and intensity of grazing during the period of flowering. In contrast, Wells (1967) reported that when sheep were removed from the pasture in early June, less than 1 percent of the flowering spikes were recorded as damaged that year.

Wells (1967) reported, that in one of the years of his study, the area was heavily grazed by sheep at a density of about 4 per acre during the summer months and in the late autumn. As a result of this, 30 percent of the flowering spikes were damaged, but 70 percent escaped damage even at that high intensity of grazing. In the final year of the study, 10 to 20 head of cattle grazed the area with the result that 22 percent of the flowering spikes were damaged, mainly by trampling.

It can be presumed that similar damage could occur to Ute ladies'-tresses as it was recorded to occur to the autumn ladies'-tresses orchid in Great Britain. The Bureau in Wyoming does permit sheep and cattle grazing on the surface lands which they administer. Therefore, the livestock grazing programs administered by the Bureau may influence the reproductive potential of any given Ute ladies'-tresses plant. It is interesting to note that even under heavy grazing, Wells (1967) documented that 70 percent of the flowering stalks escaped any damage. Seed number is not thought to be limiting to populations of *S. diluvialis* as flowering spikes have the potential to produce 5 to 30 fruits per flowering spike and each fruit can contain between 100 to 10,000 seeds (Sipes and Tepedino 1994). Therefore, even under heavy grazing pressure as described by Wells (1967), even a small population of *S. diluvialis* has the potential to produce tens of thousands of seeds.

Arft (1994) studied the effects of cattle grazing on Ute ladies'-tresses orchids along Clear Creek in Colorado and Deer Creek in southern Utah. Individual plants were monitored on a monthly basis from May to September. Data indicated that (1) the proportion of flowering individuals varied each year, (2) herbivory may prevent a large number of orchids from reproducing, and (3) it remained unclear whether past management practices such as grazing and mowing were beneficial or detrimental to sexual reproduction in *S. diluvialis*. The data suggested that the large fluctuations in population size reported in monitoring counts may be actually fluctuations in number of flowering individuals, with many individual plants remaining vegetative (non-flowering) or subterranean. During Arft's (1994) study, the proportion of flowering individuals increased from 58 percent in the first year to 80 percent in the second year of the study within the control plots, indicating flowering plants alone may not be a good indicator of population size.

It is plausible that livestock could also incidentally ingest Ute Ladies'-tresses seed heads and act as seed dispersal mechanisms to introduce the seeds to unoccupied areas and actually improve the reproductive fitness of any given plant although Wells (1967) did not mention any such documented occurrences in his study of the autumn ladies'-tresses orchid. He in fact stated that most of the damage done by cattle in his study was due to trampling and treading on the flowering spikes. No other documentation has been found in the literature relative to the topic of livestock acting as a potential seed disperser of Ute ladies' tresses orchids. This is one area where more research may be needed.

It is currently accepted that grazing activities generally benefit the habitat necessary for Ute ladies'-tresses populations if these activities are timed to occur up to one month prior to flowering. Fencing, changes in livestock seasons of use or type of livestock, and riparian improvement projects may be used to protect the flowering spikes of individual plants from crushing or removal.

The Bureau intends to continue grazing activities and surveys for Ute ladies'-tresses and if populations are discovered, grazing activities will be managed to maintain Ute ladies'-tresses populations (BLM 2005). The Bureau in Wyoming has committed to conservation measures to protect Ute ladies'-tresses (see Appendix for a complete list). The use of these conservation measures will reduce or eliminate the effects by ensuring that (1) populations are discovered prior to any surface-disturbing construction activities, (2) construction activities do not take place in occupied habitat, (3) invasive plant species infestations, if they occur, are controlled in a manner conducive to the survival of Ute ladies'-tresses, (4) the hydrologic regime of the plant's habitat is maintained and studied to determine if changes are occurring that may be detrimental to the plant, and (5) grazing activities are conducted in a manner that will maintain the habitat of the species while minimizing any removal of the plant's flowering spikes (BLM 2005).

Geology and Minerals

The extraction of methane gas from coal seams has become a significant energy source in the Powder River Basin of northeastern Wyoming (USFWS 2005). From 1976 to 1996 1,169 coal bed methane wells were drilled in the Powder River Basin. In 2001, the Powder River Basin of northeastern Wyoming had 4,000 coal bed methane wells in production (BLM 2003a). Over 39,000 coal bed methane wells are scheduled to be drilled in the Powder River Basin by 2012 (BLM 2003a). In Wyoming, coal bed methane gas is extracted by drilling wells into a coal seam and removing water to release the gas. As surveys for Ute ladies'-tresses have not been conducted over much of the area where coal bed methane development is and will be occurring, this form of energy development may affect undiscovered populations of these plants.

Each well pad for coal bed methane typically has one to three wells (one well per coal seam). Therefore, according to the description of the Powder River Basin Oil and Gas Project (see USFWS 2002), 8 well pads per section could result in 24 wells (well bores) drilled in each section. The potential short-term disturbance associated with coal bed methane development during drilling and installation of facilities is estimated to be approximately 202,843 acres. Following reclamation of pipeline rights-of-way and partial reclamation of other facilities, the long-term disturbance (roads, well pads, etc.) associated with coal bed methane development would be approximately 95,138 acres. Additional short-term and long-term disturbance associated with non-coal bed methane wells and associated facilities in the Powder River Basin is estimated to be approximately 8,803 acres and 7,520 acres, respectively.

Shallow well drilling rigs (truck-mounted water well type drilling rigs) are used for both drilling and completion activities. Each well is drilled within an estimated 1 to 3 days. Well completion occurs within an additional 1 to 3 days. Well pads are typically not leveled unless steep terrain can not be avoided. For producing wells, maintenance personnel may visit wells as often as once each day to ensure equipment is functioning properly. Two-track unimproved roads are used for access to wells as topography and drainage allow. Additional access may require the construction of up to 7,135 miles of improved roads (USFWS 2002). The Bureau is committed to conducting surveys for the Ute ladies'-tresses in suitable habitat prior to implementation of construction activities and if the plant is identified the Bureau is committed to applying a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known populations of the orchid (see Appendix). Pipelines, powerlines, and roads will also be located outside of a 0.25 mile buffer for Ute ladies'-tresses populations (see Appendix). However, due to the ability of the plant to persist underground for years and remain undetectable by survey efforts, it is still possible that construction and surface disturbance associated with well drilling, powerlines, roads, or pipelines may directly affect populations of Ute ladies'-tresses orchids which may not have been identified by survey efforts.

Coal bed methane wells dewater aquifers and discharge an average of 10 gallons of water per minute with a maximum of 100 gallons per minute (BLM 2003a). An annual average of 28,014 acre-feet of coal bed methane discharged water is expected to be released into the Powder River Basin from 2002 to 2017 (BLM 2003a). Coal bed methane discharged water is disposed of by direct discharge to surface drainages, passive treatment prior to surface discharge, discharge to upland and bottomland infiltration impoundments, discharge to containment impoundments, and deep well injection. Untreated discharge to surface drainages is the primary method of disposal provided that the coal bed methane well discharged water meets Wyoming water quality standards. It is the dewatering of aquifers or discharging of water to surface drainages which could potentially affect Ute ladies'-tresses by inundation, dessication, erosion, sedimentation, or chemical manipulation of the habitat.

Coal bed methane water with lower water quality standards may be discharged into closed containment ponds for infiltration and evaporation. Some water quality parameters of concern are petroleum hydrocarbons, specific conductance, pH, radium-226, iron, manganese, barium, arsenic, zinc, halite, selenium, and chloride. Selenium bioaccumulates in aquatic vegetation and invertebrates. If coal bed methane water contains high concentrations of dissolved salts, it is unsuitable for irrigation and toxic to native plants. Soils irrigated with high salinity water will adversely impact vegetation and soils. Soils irrigated with high sodium absorption ratio water will alter the soils, creating hard pans and adversely affect vegetation. The sodium absorption ratio of produced water typically is 10-12 times the level beyond which soil will maintain structure to support plant productivity. While there is debate over absolute values for acceptable limits for the sodium absorption ratio, there is consistent agreement that a high sodium absorption ratio for water can significantly impair many soils, particularly irrigated soils and soils located in arid or semi-arid regions (Bauder 2002). Consequently, important Ute ladies'-tresses habitat could be severely impacted or eliminated by surface discharge of coal bed methane water. Discharging large volumes of coal bed water into rivers and streams can severely impact riparian species and their habitats.

The construction of reservoirs and associated facilities for disposal of water produced during the development of coal bed methane wells can also adversely affect groundwater and surface water. Infiltration or percolation from reservoirs or other facilities of coal bed methane water containing

high levels of salts or trace elements can reach groundwater and eventually seep out and reach surface waters. Additionally, groundwater could seep into low areas or basins in upland sites. Reservoirs typically raise the level of the water table of shallow aquifers. This raised water table level can extend a considerable distance down gradient within the water table (Winter et al. 1998). If site conditions are suitable, a shallow, underground water aquifer can surface downstream of coal bed methane water reservoir. Infiltration of coal bed methane produced water from a treatment reservoir through the underlying strata can leach salts and trace elements.

Coal bed methane discharged water with elevated salts and or trace elements would result in greater concentrations of these contaminants in the groundwater than would otherwise be present. Pitt et al. (1994) state that “once contamination with salts begins, the movement of salts into the groundwater can be rapid”. Bartos and Ogle (2002) characterized groundwater samples from coalbed aquifers in the Powder River Basin in the medium to very high salinity hazard classes which are not suitable for application on soil. Important habitat may be severely impacted or eliminated by the impoundment of coal bed methane water discharges in the high and very high salinity hazard class of groundwater aquifers. Seepage of this water can alter riparian or stream side vegetation including Ute ladies’-tresses orchids. Additionally, mineral deposits, such as salt and gypsum, in exposed reservoir sediments could prevent the establishment of vegetation at the reservoir site after discharge of coal bed methane produced water ceases.

A coal bed methane reservoir placed on or immediately upstream of an intermittent stream reach could result in the potential contamination of the shallow ground water. In general, the highest concentrations of sodium, the highest sodium absorption ratio, and the highest water conductivities occur in the Powder River, Tongue River, and Clear Creek watersheds in northeastern Wyoming (USFWS 2005).

Based on the reasonable foreseeable development of coal bed methane wells in the Buffalo and Platte River Resource Areas, it is likely that some of these coal bed methane wells may adversely affect some, as of yet, undiscovered Ute ladies'-tresses populations either on Bureau-administered lands or on private or state-owned lands downstream.

Under the Bureau’s current management scenario, it can be expected that in some cases, coal bed methane produced water will be discharged into perennial, ephemeral, or dry drainages, increasing flows and changing the dynamics of the drainage systems. Some of this discharged water may be high in trace elements, and/or sodium, causing death, lack of vigor, or reduced reproductive capacity of Ute ladies'-tresses orchids and other plants. High volumes of discharged water may also cause significant erosion or sedimentation of the habitat leaving Ute ladies’-tresses populations buried under sediment, covered by water, or washed downstream. Lowering of the water table could result in significant drying of the stream bed and vegetative changes in some areas. However, flows in other streams may be only moderately or minimally reduced and Ute ladies’-tresses may be unaffected in these cases.

The Bureau is committed to conducting surveys for Ute ladies’-tresses orchids in suitable Ute ladies’-tresses habitat on the lands it administers prior to beginning potentially disturbing projects (see Appendix) and if necessary will modify the action to protect the habitat and/or the species. However, even surveys performed according to protocol may not be able to detect the presence of the plant in all cases. Due to the ability of Ute ladies’-tresses to persist below ground for years before emerging, negative survey results in suitable habitat do not guarantee

that the plant is not present. Thus, direct impacts to Ute ladies'-tresses plants from coal bed methane development could occur on Bureau-administered lands. In addition, direct impacts from Bureau-authorized coal bed methane development could also occur on private and state-owned lands downstream from Bureau-administered lands. The Bureau may have no legal access or authority for performing surveys on those lands. If the plant is present on those lands downstream, loss of the entire population or some part of it may occur if surface disturbance from streambank erosion, habitat inundation, or changes to hydrology or water quality occurs.

Although the Bureau has committed to (1) avoidance of Ute ladies'-tresses orchid habitat where known populations exist, and (2) surveying in suitable habitat; complete avoidance of all Ute ladies'-tresses populations is not likely to occur, given that surveys do not detect all plants present in any given location. The plant spends much of its life below ground in a non-flowering state. Reclamation of drill pads, roads, and pipelines also involves ground disturbing activities possibly leading to undocumented Ute ladies'-tresses plants in an area. Reclamation activities may result in the loss of undetected individual plants or populations of this orchid, as well.

Interrelated and Interdependent Effects: The highly interspersed surface and mineral ownership of coal bed methane development occurring in the Powder River Basin creates challenges for protection of the Ute ladies'-tresses orchid and suitable habitat. There will be some actions regarding non-federal surface and/or minerals that would not occur but for a federal action (i.e., they are interrelated or interdependent to the federal action). Rights-of-way for access to non-federal in-holdings is an example of a common federal action leading to interrelated and interdependent actions on non-federal lands.

Development of coal bed methane on non-federal lands as a result of a Bureau action could have the same effects on the Ute ladies'-tresses orchid as coal bed methane development on federal minerals. To the extent that these actions are interrelated or interdependent to a federal action, any effects to this orchid associated with development of non-federal minerals must be considered prior to permit issuance or other authorization by the Bureau.

Summary

Grazing. Ute ladies'-tresses populations in Wyoming are typically found in areas where livestock grazing has maintained the habitat in areas where competing vegetation has been removed and there is a fair amount of bare ground surface (Fertig 2004) characteristic of an area that has been partially grazed regularly. However, activities authorized in the livestock grazing program may damage individual plants. The degree to which the plants can sustain damage and not be "adversely affected" is currently unknown but it is suspected that the activities authorized in the livestock grazing program may affect individual Ute ladies'-tresses orchid's reproductive success.

The Bureau determined that livestock grazing activities on its lands "may affect", or are "likely to adversely affect" the Ute ladies'-tresses based on the potential for browsing or trampling of the flowering spikes of individual Ute ladies'-tresses plants. However, current livestock grazing practices have not proven detrimental to populations of this plant and may provide beneficial effects to Ute ladies'-tresses populations, if they exist within the Bureau's resource areas in Wyoming and are managed properly.

It is anticipated that livestock grazing actions authorized under the Bureau's RMPs in Wyoming could result in negative impacts to the Ute ladies'-tresses from harm or destruction of individual plants. Livestock Grazing Management according to the Bureau's RMPs and the Bureau-committed conservation measures of the Statewide Programmatic Ute ladies'-tresses BA could lead to harm, destruction, or reduced fitness of individual Ute ladies'-tresses plants by trampling, crushing, or grazing of the flowering spikes. However, beneficial effects of grazing, if conducted during appropriate times, are also known to maintain the habitat for this species. Any complete cessation of livestock grazing could also lead to increased growth of overstory plants and loss of habitat for Ute ladies'-tresses.

Coal Bed Methane Development. Ute ladies'-tresses populations in Wyoming are currently not known to occupy areas coinciding with or downstream from locations where coal bed methane development is occurring. However, surveys for Ute ladies'-tresses populations adjacent to and downstream from on-going coal bed methane development are lacking. Given the lack of surveys in coal bed methane development areas in the past and the potential for plants to go undetected during survey efforts, it is possible that Ute ladies'-tresses are present in areas of coal bed methane development. With the large quantity and sometimes poor quality of coal bed methane produced water discharged into streams, the potential for adversely affecting Ute ladies'-tresses plants, if they do occur in those areas, remains high.

Coal bed methane development may cause dewatering of subterranean aquifers, drying of riparian habitat, desiccation of Ute ladies'-tresses plants and habitat, increased erosion rates, discharge of poor quality water, or direct habitat removal. The dewatering of subterranean aquifers underneath any Ute ladies'-tresses plant populations could cause major shifts in hydrologic regimes which could cause drying of the riparian areas upon which riparian plants such as Ute ladies'-tresses depend. Drying of the streams could cause desiccation of the plants and their habitat and could cause local extirpation of populations of this federally threatened plant species. Likewise, inundation of the habitat by increased water discharge could make it difficult or impossible for some populations to persist. Increased erosion rates may cause the soil comprising the habitat of the species and the plants themselves to wash downstream leading to death of the Ute ladies'-tresses plants and loss of their habitat. Discharge of poor quality water into the drainages with Ute ladies'-tresses plants could similarly result in death of plants and extirpation of populations as the habitat becomes too extreme in certain chemical parameters such as a high sodium absorption ratio which would make the plant unable to persist in its habitat. Direct habitat removal or destruction of Ute ladies'-tresses plants or habitat for well pad, access road, powerline, or pipeline construction activities may occur if surveys are implemented but fail to identify the presence of the plants even though a population of plants is present. This could occur since Ute ladies'-tresses orchids may remain underground for years with no identifying above-ground parts.

The Bureau determined that coal bed methane development on its lands “may affect and is likely to adversely affect” the Ute ladies'-tresses based on the potential for changes in habitat and hydrology, sedimentation, and erosion. However, currently there are no known populations of this plant known to be adversely affected by these activities.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Non-federal activities which may cumulatively affect Ute ladies'-tresses across Wyoming include oil and gas (including coal bed methane) development, uranium mining; sand, gravel, and scoria mining; road and railroad construction, and rural and urban housing development, hard rock mining (including coal, trona, and phosphates), subdivision development along rivers, recreation along rivers and river corridors (including camping, rafting, hunting, and golf course development), municipal solid waste landfill expansions, housing developments, stockyard operations for livestock, and farming near and within riparian corridors.

Impacts to Ute ladies'-tresses orchids could result from livestock operations on private lands in the Bureau's resource areas in Wyoming. These impacts could be beneficial (maintaining habitat through grazing), or detrimental (limiting individual orchid reproductive fitness by removal of fruiting parts through trampling or ingestion). The nature of the impacts from livestock operations is likely to be fairly similar across land ownerships (BLM 2005).

Mowing and haying on private and state lands could be beneficial to Ute ladies'-tresses populations. However, these activities could also be detrimental if done before fruits have ripened, or if the height of hay cutting is too low. Late season mowing (after the fruit have ripened) may be one of the best management tools available for maintaining the habitat of this species. In many current management situations, the timing of mowing is related to growth conditions of the hay crop and weather patterns rather than the biological needs of Ute ladies'-tresses. Mowing has little impact on the leaves of the rosettes and probably does not result in population declines (Fertig 2000).

If coalbed methane development on private lands in the area occurred in occupied Ute ladies'-tresses habitat, it could alter riparian stream channel functions. Dewatering of aquifers in preparation for methane extraction and the combined discharge of such waters into surface streams could cause significant changes to stream hydrology, water and soil quality, sedimentation, or erosion of habitat thereby potentially impacting any extant Ute ladies'-tresses populations occurring in those drainages.

A substantial amount of the surface ownership within the project area is private and many of the oil and gas rights are privately owned. Many new wells and many miles of roads and pipelines are reasonably certain to occur on private lands in the Bureau's resource areas. This is evidenced by the current and historic rates of coal bed methane development on private land throughout the Powder River Basin of the Buffalo Resource Area. The number of coal bed methane wells already drilled or permitted for drilling on private surface/private minerals within the project area has risen to 14,116 coal bed methane wells (Litwartz 2002). Therefore, it can reasonably be expected that future coal bed methane development will continue. Also, four to six new coal-fired power generation plants have been proposed for the Powder River Basin in northeastern Wyoming. The construction of power plants and associated infrastructure could result in additional loss of some Ute ladies'-tresses habitat.

Finally, the data are not adequate to determine the distribution and abundance of all Ute ladies'-tresses populations on private or state-owned lands in the Bureau's resource areas. Likewise, accurate estimates of suitable habitat for this species on private or state-owned lands is, in many cases, lacking or incomplete. However, suitable habitat likely occurs throughout the area, therefore, prior to any disturbing construction activity that could occur in Ute ladies'-tresses habitat, the Bureau has committed to performing surveys for this orchid (BLM 2005) and if necessary will modify the action to protect the habitat and/or the species

Grazing is widespread and occurs on much of the private and state-owned lands in Wyoming. Likewise, there is much privately-owned surface and subsurface mineral development occurring in the Powder River Basin of northeastern Wyoming. Both grazing and coal bed methane development activities on privately-owned and state lands are likely to adversely affect Ute ladies'-tresses orchids in similar fashions, to similar degrees, and in addition to those federal actions addressed in this opinion.

CONCLUSION

After reviewing the current status of the Ute ladies'-tresses, the environmental baseline for the action area, the effects of the Resource Management Plans and the Bureau-committed conservation measures, and the cumulative effects; it is the Service biological opinion that the direct and indirect effects of the implementation of the Bureau's Buffalo, Platte River, Cody, Kemmerer, Lander, Newcastle, Pinedale, Great Divide, Green River, Worland-Grass Creek, and Worland-Washakie RMPs with commitment to conservation measures, as proposed, are not likely to jeopardize the continued existence of the Ute ladies'-tresses orchid. Critical habitat has not been designated, therefore none will be affected.

The Service has reached this conclusion by considering the following.

1. It appears that this species is more widespread and numerous than was previously known. At the time of listing, the total known Ute ladies'-tresses population numbered approximately 6,000 individuals. Extensive census efforts from 1991-1995 revealed that the known population size was approximately 20,500 individuals. Since 1995, several new populations have been located adjacent to the action area, one of which contained several thousand individuals. Between 1992-1999, the total known population of the Ute ladies'-tresses orchid observed across its range reached over 60,000 individuals (USFWS 2004a). It is expected that new populations will continue to be discovered as not all potential habitat has been surveyed.
2. The Bureau is not proposing to implement any significant changes to the management of any Ute ladies'-tresses known occupied habitat that may cause detrimental impacts to those populations.
3. The Bureau is committed to implementing protective measures (see Appendix) to minimize potential impacts to Ute ladies'-tresses.
4. Finally, although individuals can be adversely impacted by livestock grazing activities (trampling, ingestion, etc.), the population seems to withstand some grazing pressure and may actually rely on these activities for maintenance of their habitat.

INCIDENTAL TAKE

Section 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed plants or the malicious damage of such plants on areas under federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of state law or regulation or in the course of any violation of a state criminal trespass law.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations (CR) are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7 responsibility for these species.

- CR1. In known occupied Ute ladies'-tresses habitat, the Service recommends that the Bureau use management actions that are compatible with protection and conservation of pollinators of the Ute ladies'-tresses orchid.

- CR2. The Service recommends that the Bureau monitor and manage invasive species so these do not impact the Ute ladies'-tresses orchid or its habitat.

- CR3. The Service recommends that the Bureau not authorize herbicide use in known or occupied Ute ladies'-tresses habitat without prior review by Service biologists.

RE-INITIATION NOTICE

This concludes formal consultation of the actions outlined in the request. As provided in 50 Section 402.16, re-initiation of formal consultation is required where discretionary federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing take must cease pending re-initiation.

Thank you for your assistance in the conservation of this threatened species. In future communications regarding this Biological Opinion, please refer to consultation number ES-6-WY-06-F003. If we may be of further assistance, please contact Alex Schubert of my staff at (307) 772-2374, ext. 238.

cc: BLM, Endangered Species Coordinator, State Office, Cheyenne, WY (J. Carroll)
FWS, Endangered Species, Lakewood, CO (B. Fehey)
FWS, Utah ES Office, Salt Lake City, UT (L. Jordan)
WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (V. Stelter)
WGFD, Non-Game Coordinator, Lander, WY (B. Oakleaf)

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APPENDIX – CONSERVATION STRATEGY MODIFIED FROM THE STATEWIDE PROGRAMMATIC BIOLOGICAL ASSESSMENT: UTE LADIES'-TRESSES (*Spiranthes diluvialis*) (BLM 2005)

These conservation strategies are modified from the Statewide Programmatic Biological Assessment: Ute ladies'-tresses (*Spiranthes diluvialis*) (BLM 2005). Implementation of the following conservation strategies is intended to minimize, or eliminate, adverse impacts to the Ute ladies'-tresses orchid that are likely to result from implementation of the management actions provided in the Wyoming Bureau Resource Management Plans. The Bureau has committed to implement Conservation Measures 1 through 24. The Bureau also will consider implementing Best Management Practices 1 through 20 to further protect listed species.

1. Surface disturbance will be prohibited within 500 feet of surface water and/or riparian areas.
2. No Surface Occupancy will be allowed within special management areas (e.g., known threatened or endangered species habitat).
3. Portions of the authorized use area are known or suspected to be essential habitat for threatened or endangered species. Prior to conducting any onsite activities, the lessee/permittee will be required to conduct inventories or studies in accordance with Bureau and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of this species. In the event that an occurrence is identified, the lessee/permittee will be required to modify operational plans to include the protection requirements of this species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).
4. Within the potential of the ecological site (soil type, landform, climate, and geology), the Bureau will ensure that the soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.
5. The Bureau will ensure that grazing management practices will restore, maintain, or improve plant communities. Grazing management strategies consider hydrology, physical attributes, and potential for the watershed and the ecological site.
6. The Bureau will ensure that upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.
7. The Bureau will ensure that rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.
8. The Bureau will ensure that grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of federally threatened and endangered species or the conservation of federally-listed species of concern and other State-designated special status species. Grazing management practices will maintain existing habitat or facilitate vegetation change

toward desired habitats. Grazing management will consider threatened and endangered species and their habitats.

9. The Bureau will maintain biological diversity of plant and animal species; support the Wyoming Game and Fish Department strategic plan population objective levels to the extent practical and to the extent consistent with Bureau multiple use management requirements; maintain, and where possible, improve forage production and quality of rangelands, fisheries, and wildlife habitat; and to the extent possible, provide habitat for threatened and endangered and special status plant and animal species on all public lands in compliance with the Endangered Species Act and approved recovery plans.
10. In any proposed new access, wetland and riparian areas will be avoided where possible.
11. Grazing will be intensively managed within known habitat containing populations from July through September, to allow plants to bloom and go to seed.
12. Recreational site development will not be authorized in known Ute ladies'-tresses habitat.
13. The Bureau will manage stream habitats to retain, re-create, or mimic natural hydrology, water quality, and related vegetation dynamics. Projects that may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem and cause direct ground disturbance will be evaluated and redesigned to ensure that adverse effects to populations of the orchid do not occur.
14. The Bureau will add the following two conservation measures to grazing permit renewals in allotments with known Ute ladies'-tresses populations.
 - A. The Bureau will ensure the placement of mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known Ute ladies'-tresses populations. Supplemental feed for livestock, wildlife, or wild horses will not be authorized within 1.0 mile of known Ute ladies'-tresses populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Ute ladies'-tresses populations and potential overgrazing of the areas occupied by these orchids. Surveys for Ute ladies'-tresses will be conducted in potential Ute ladies'-tresses prior to livestock operations-related construction projects.
 - B. The Bureau will not increase permitted livestock stocking levels in any allotment with pastures containing known Ute ladies'-tresses populations without consulting with the Service.
15. Biological control of noxious plant species will be prohibited within 1.0 mile from known orchid habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. The Bureau will monitor biological control vectors.

16. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be well-regulated within 0.25 miles of known populations of the orchid and insecticide/pesticide treatments will be well-regulated within 1.0 mile of known populations of the orchid to protect pollinators.

Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above the following will apply: where needed and only on a case-by-case basis, a pesticide use proposal or other site specific plan will address concerns of proper timing, methods of use, and chemicals. Pesticides specific to dicots will be preferred where these are adequate to control the noxious weeds present.

Aerial application of herbicides will be carefully planned to prevent drift in areas near known populations of the orchid (outside of the 0.25 mile buffer). The Bureau will work with the Animal and Plant Health Inspection Service (APHIS), the Service, and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the orchid.

17. If revegetation projects are conducted within 0.25 miles of known habitat for the orchid, only native species will be selected. This conservation measure will reduce the possibility that non-native species will be introduced and will compete with Ute ladies'-tresses orchids.
18. The Bureau will limit the use of off road vehicles (OHVs) to designated roads and trails within 0.5 mile of known Ute ladies'-tresses populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known Ute ladies'-tresses populations. Roads that have the potential to impact Ute ladies'-tresses orchids and are not required for routine operations or maintenance of developed projects, or lead to abandoned projects will be reclaimed as directed by the Bureau.
19. The Bureau will apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known populations of the orchid. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing populations of the orchid. Operations outside of the 0.25 mile buffer of orchid populations, such as "directional drilling" to reach oil or gas resources underneath the orchid's habitat, would be acceptable.
20. For known Ute ladies'-tresses populations, the Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of known Ute ladies'-tresses populations. For existing oil and gas leases with known Ute ladies'-tresses populations (these would be for newly discovered populations not currently documented), the Bureau will require the COA in conservation measure 19 above including the same 0.25 mile buffer area around those known Ute ladies'-tresses populations.
21. The disposal (sale and removal) of salable minerals is a discretionary Bureau action and is prohibited within a 0.25 mile buffer area of known populations of Ute ladies'-tresses orchids.

22. To prevent loss of habitat for the orchid, the Bureau “shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival” (BLM 2001). Prior to any land tenure adjustments in *known* habitat for the orchid, the Bureau will survey to assess the habitat boundary and retain that area in Federal ownership. Bureau-administered public lands that contain identified habitat for the orchid will not be exchanged or sold, unless it benefits the species.
23. All proposed rights-of-way projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 miles from any known orchid habitat to minimize disturbances. If avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service.
24. All proposed projects will be designed and locations selected to minimize disturbances to known Ute ladies’-tresses populations, and if the avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service. Projects will not be authorized closer than 0.25 miles from any known Ute ladies’-tresses populations without concurrence of the Service and the Bureau authorized officer. No ground disturbing construction activities will be authorized within 0.25 miles of any known Ute ladies’-tresses populations during the essential growing season time period (from July to September, the growing, flowering and fruiting stages) to reduce impacts to the species.
25. In order to conserve and protect natural areas, planned recreational foot trails are created to control human traffic. The Bureau will create programs that will strive to protect the orchid’s habitat and prevent new trails from being constructed within 0.25 miles from known occurrences of the orchid.

Best Management Practices

The following Best Management Practices are to be considered on a case-by-case basis at the project level, and implemented where appropriate, to further protect the Ute ladies’-tresses orchid.

1. When project proposals are received, the Bureau will initiate coordination with the Service at the earliest possible date so that both agencies can advise on project design. This should minimize the need to redesign projects at a later date to include orchid conservation measures, determined as appropriate by the Service.
2. The Bureau will participate in the development of both, a conservation agreement/assessment strategy and a species specific recovery plan for the orchid in coordination with the Service and other agencies as appropriate. Orchid habitat on Bureau-administered lands will be monitored to determine if recovery/conservation objectives are being met.
3. The Bureau will coordinate with the Service, the National Resource Conservation Service, and private landowners to ensure adequate protection for the orchid and its habitat when new activities are proposed, and to work proactively to enhance the survival of the plant.

4. In the event that a new population of the orchid is found, the Service's Wyoming Field Office (307) 772-2374 will be notified within 48 hours of discovery.
5. Livestock grazing, mowing/haying, and some burning are specific management tools that the Bureau may use to maintain favorable habitat conditions for the orchid where feasible. Mowing and grazing, with proper timing and intensity, reduce the native and exotic plant competition for light and possibly for water, space and nutrients.
6. Recreational foot trails that may be located adjacent to Ute ladies' tresses plant habitat should be constructed to reduce impacts to this species.
7. To prevent loss of habitat for the orchid, the Bureau "shall retain in federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival". Prior to any land tenure adjustments in *potential* orchid habitat, the Bureau will survey to assess the potential for the existence of the orchid. While it is difficult to assess whether the orchid was historically present on such sites, the Bureau should try and retain in federal ownership all habitats essential for the survival and recovery of the orchid, including habitat that was used historically, that has retained its potential to sustain this listed species, and is deemed to be essential to their survival. Potential orchid habitat may be used for reintroduction efforts and is important for the recovery and enhancement of the species.
8. Prescribed fire and grazing activities shall be coordinated between biologists, rangeland management specialists, and fire personnel to ensure that no damage occurs to the plant habitat when being used to maintain the habitat for the species.
9. Maintain and restore the dynamics of stream systems, including the movement of streams within their floodplains, which are vital for the life cycle of the orchid. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained where these plants occur. The Bureau should continue water use in a manner that maintains suitable habitat for the Ute ladies' tresses orchid to benefit the species.
10. Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.
11. For the protection of the orchid and its potential habitat, surface-disturbing activities listed above, should be avoided in the following areas when they occur outside of the protective 0.25 buffer from populations of the orchid: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands, and; (c) areas within 100 feet from the inner gorge of ephemeral channels.
12. Form a steering committee to develop and prioritize management practices and assist Bureau and Service with research projects.
13. Conduct inventories for the orchid in areas with potential habitat.
14. Maintain a database of all searched, inventoried, or monitored orchid sites.

15. Analyze vegetation treatments (mowing, prescribed fire, mechanical treatments, etc.) in known or potential habitat for the orchid to determine impacts to the species.
16. Establish monitoring, biological, ecological, population demographics, and life history studies as funding and staffing allow, such as, monitoring current populations each year for trends, studies regarding identification of pollinators, genetics, life history, effects of pesticides and herbicides, seed viability and germination, and studies regarding monitoring the success of reintroduction efforts. Monitor orchid population sites for invasion by noxious and invasive plant species.
17. Perform monitoring and analysis pertaining to flow timing, flow quantity, and water table characteristics with the goal of ensuring that riparian vegetation, in areas of known and potential habitat for the orchid, is maintained.
18. When possible, collect and bank orchid seeds at local, regional, national, and international arboreta, seed banks, and botanical gardens as insurance against catastrophic events, for use in biological studies, and for possible introduction/reintroduction into potential habitat.
19. Train law enforcement personnel on protections for the orchid and its habitat, its status, and current threats to its existence.
20. Educate resource specialists, rangers, and fire crews about the orchid and its habitat to help with project design for the general area and for fire suppression actions occurring in potential habitat for the orchid and on the habitat characteristics and plant identification for the plant, so that if they encounter the orchid occurring in riparian habitat, they can report it to their office threatened and endangered species specialist.
21. The Bureau should work towards developing reintroduction sites in coordination with the Service and to maintain the integrity of these sites for the survival of the orchid. The objective would be to reintroduce populations of the orchid into areas of historic occurrence and introduce new populations in suitable habitat within the plant's historic range.
22. Develop propagation techniques and use them to reintroduce/introduce the orchid and to repopulate known populations in the event population recovery becomes necessary.

APPENDIX - REFERENCES

United States Bureau of Land Management (BLM). 2001. Manual 6840 – Special Status Species Management. United States Department of the Interior Bureau of Land Management. January 19, 2001. 41 pp. + Glossary.

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